

**UTAH DIVISION OF OIL, GAS AND MINING
STATE DECISION DOCUMENT AND
TECHNICAL ANALYSIS**

Hidden Splendor Resources, Inc.

HORIZON MINE

C/007/0020

Carbon County, Utah

July 1, 2005

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Mine # C/007/0020
File Outgoing
Record # 0022
Doc. Date 7-1-05
Recd. Date _____

ADMINISTRATIVE OVERVIEW

Hidden Splendor Resources, Inc.

HORIZON MINE

C/007/020

Carbon County, Utah

July 1, 2005

Background

The Horizon Mine is located in Consumers Canyon approximately 13 miles northwest of Price. A variety of coal mining activities occurred between 1921 and 1952 in the vicinity of the Horizon Coal Mine area. Several mines extracted coal from two coal seams, the Castlegate "A" and the Hiawatha seams.

C and W Mining Company submitted a permit application for these mines in 1982, but a bond was never posted, and therefore, a permit never issued. The Blue Blaze Coal Company submitted a permit application for the Blue Blaze Coal Mine in March 1989. The permitting process proceeded for three years, whereupon the Division was prepared to issue a permit with ten stipulations on May 29, 1992. However, a bond was never posted and thus the permit was never issued to Blue Blaze.

On March 29, 1995 the Division was notified that the permit application PRO/007/020 had been assigned by Blue Blaze Coal Company to Horizon Coal Corporation. Horizon then proceeded to revise and update the application in the pursuit of a permit to mine coal. Horizon submitted an application on May 2, 1995 and a permit was issued on October 10, 1996, which authorized mining on approximately 317 acres of primarily fee lease (17 acres in a BLM Right-of-Way). The surface disturbed area consists of 9.15 acres and contains the typical support facilities for a small underground mine (i.e. portals, fan, office, shop, supply and bath trailers, conveyors, pad and stockpile areas). The permit was transferred to Horizon Mining, LLC on November 6, 1997 and then to Lodestar Energy, Inc. on July 14, 1999. The need for additional lease acreage soon became apparent and Horizon Mining, LLC acquired the Beaver Creek Federal Lease on September 1, 1998 through the Lease By Application (LBA) process. This lease was acquired by Lodestar Energy, Inc. as part of its asset purchase from Horizon LLC, dated July 14, 1999. Lodestar applied to permit a portion of the Beaver Creek Coal Lease, (406 acres of the 1288-acre federal lease (area south of Beaver Creek) because adequate baseline hydrologic data had been collected in that area. The area north of Beaver Creek needed more hydrologic data and is the subject of this permitting action. The 406-acre area south of Beaver Creek was approved in February 2001. The addition of a portion of federal U-78404 was approved on July 9, 2001 as an underground extension of the existing Horizon mine.

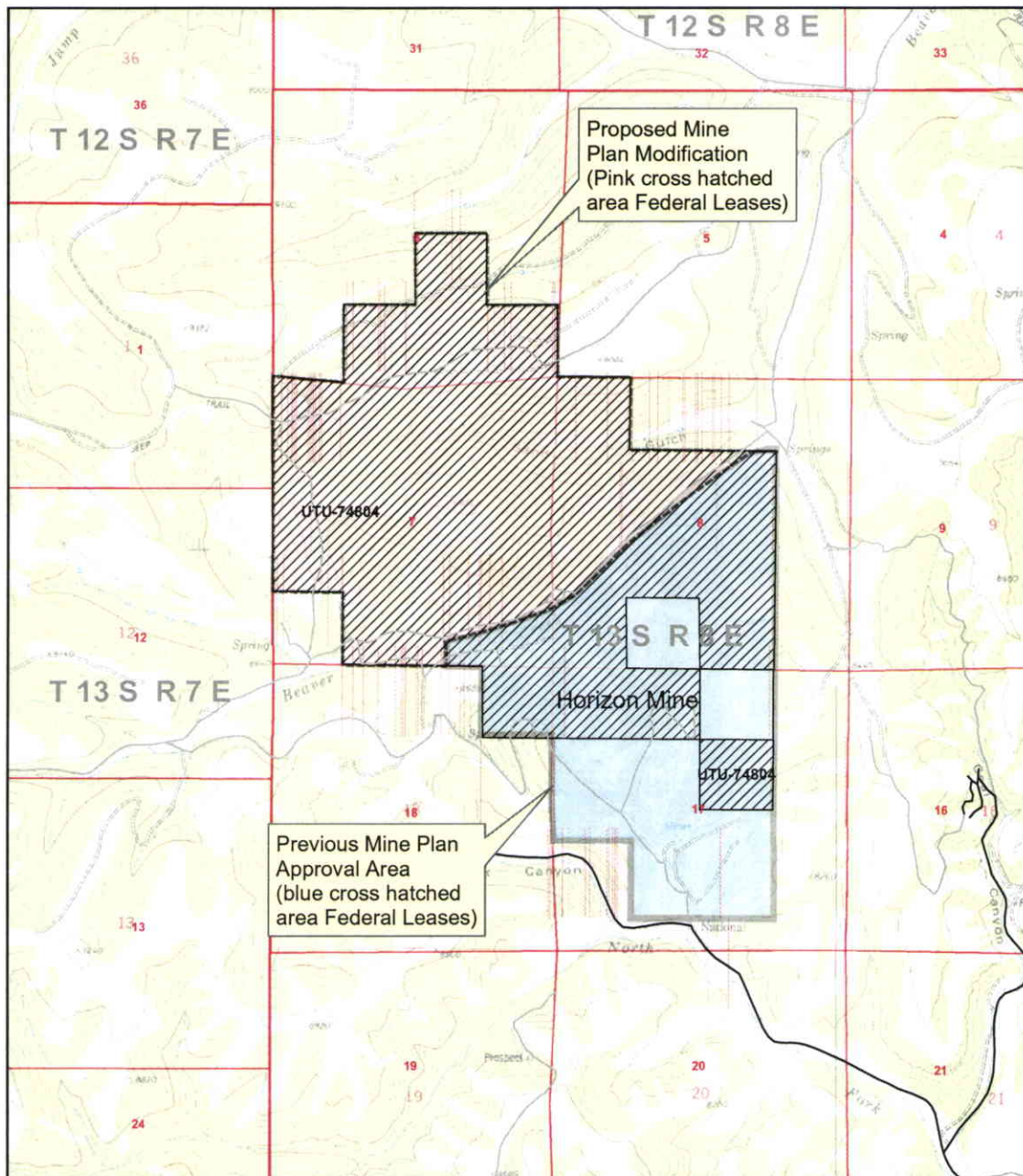
The permit was transferred from Lodestar Energy, Inc. to Hidden Splendor Resources, Inc. on July 1, 2003.

Description of the Proposal

No additional surface disturbance is planned for this permitting action, i.e. the remaining 866 acres north of Beaver Creek. Mining will be a room and pillar operation. The permit boundary contains 1577 acres; 1272 acres of federal lease and the remaining 305 acres are fee leases. There are 40 acres of federal land owned by the Bureau of Land Management. Mining will be done entirely in the Hiawatha seam commencing at a rate of 300,000 tons per year and increasing to a rate of 500,000 tons. The lease extension is estimated to contain approximately 4.6 million tons of recoverable coal.

Recommendation for Approval

This recommendation for approval is based on the complete permit application package (PAP), the Technical Analysis (TA) conducted by the Division, the Cumulative Hydrologic Impact Assessment CHIA also prepared by the Division, the approval of the R2P2 by the BLM, and the administrative record. Hidden Splendor Resources, Inc. has demonstrated that mining within the permit boundary can be done in conformance with the Surface Mining Control and Reclamation Act, and the corresponding Utah Act and performance standards. The 510(c) report on the Applicant Violator System for this mine has no issues.

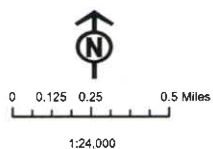


Horizon Mine Mining Plan Approval Area

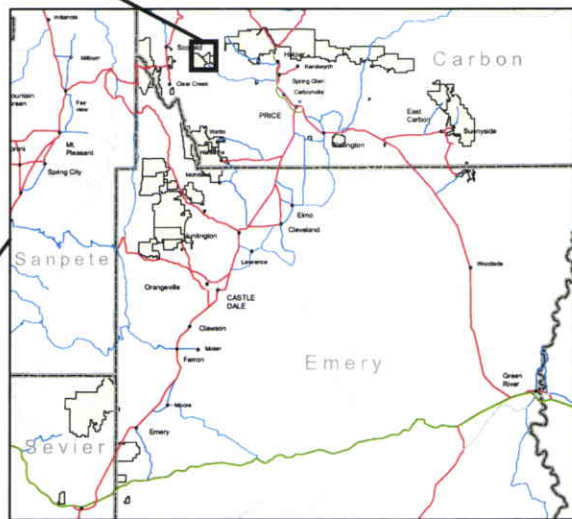
ACT0070020
Carbon County, Utah
March 2005

Township 12 South Range 7 & 8 East
Township 13 South Range 7 & 8 East

File: N:\gis\coal\coalareamaps\C0070020Fed.pdf



State of Utah
Department of Natural Resources
Division of Oil, Gas and Mining



Locator Map

PERMITTING CHRONOLOGY

Hidden Splendor Resources, Inc.

Beaver Creek Lease

Horizon Mine

C/007/020

Carbon County, Utah

July 1, 2005

May 21, 2004	Hidden Splendor Resources, Inc. submitted the permit application package for the remainder of Lease UTU-74804 to the Horizon Mine (866 acres).
July 9, 2004	The permit application was determined to be administratively complete which initiated the technical review and public participation process.
July 26, 2004	The Division sent letters to state, federal and local planning agencies about the complete permit application. Additionally, permit application packages were sent to appropriate federal and state agencies.
July 27, August 3, 10 and 17, 2004	This permitting action, intent to expand the Horizon Mine into the remainder of Beaver Creek Lease (UTU-74804), is published in the <u>Sun Advocate</u> , for four consecutive weeks.
August 17, 2004	Affidavit of Publication for Horizon Mine lease addition.
August 18, 2004	Steve and Pete Stamatakis request water monitoring records and request bond be put in place on property for 50 years because subsidence will not "show up until later years".
August 23, 2004	Pete Stamatakis sends letter of opposition to Horizon Mine lease addition.
August 31, 2004	Mary Ann Wright, Associate Director, Mining, offers a Division hydrologist to work with Pete and Steve Stamatakis to access water monitoring records directly from the Division website and the Price Field Office. She also explains how bonding is not required for subsidence, rather liability insurance. She explains that they will need to request an informal conference in writing and it will be scheduled.
September 16, 2004	Steve and Pete Stamatakis request an informal conference.

September 21, 2004	Technical review mailed to Hidden Splendor Resources, Inc.
October 7, 2004	Publication notice of October 22, 2004 Informal Conference for the Horizon Mine lease addition.
October 22, 2004	Informal Conference scheduled.
November 1, 2004	Publication notice of rescheduled Informal Conference for Horizon Mine lease addition on November 19, 2004.
November 19, 2004	Informal Conference conducted.
December 23, 2004	Findings, Conclusion and Order from the November 19, 2004 Informal Conference issued.
January 13, 2005	Hidden Splendor Resources, submits response to September 21, 2004 technical deficiency document.
February 7, 2005	Approval of modification of R2P2 for entire Horizon Mine lease.
March 9, 2005	Technical review mailed to Hidden Splendor Resources, Inc.
April 8, 2005	Hidden Splendor Resources, Inc. submits response to March 9, 2005 technical deficiency document.
May 9, 2005	Section (7) consultation is completed by Fish and Wildlife Service
June 1, 2005	Bureau of Land Management as the surface managing agency concurs with this permitting action.
June 10, 2005	SHPO concurs with the report's recommendation that <u>No Historic Properties</u> will be impacted within the Beaver Creek Lease addition to the Horizon Mine.
June 13, 2005	Division completes the Technical Analysis and Cumulative Hydrologic Impact Assessment.
June 24, 2005	AVS check completed with issue recommendation
June 30, 2005	Hidden Splendor Resources, Inc. submits a rider to the letter of credit to include the Office of Surface Mining as a beneficiary as well as on the deed for the Collateral.
July 1, 2005	The Division's Decision Document is completed and application is approved, revised permit issued with a condition that mining may not begin in this portion of the federal lease until the mining plan is approved. .

FINDINGS

Hidden Splendor Resources, Inc.
Horizon Mine
C/007/0020
Carbon County, Utah


July 1, 2005

1. All procedures for public participation required by the Act, and the approved Utah State Program have been complied with. See Affidavit of Publication dated August 17, 2004 in Appendix 2-2 of PAP. (R645-300-120)
2. The permit application for the extraction of coal from the Beaver Creek Federal Lease (U-74804) using the associated surface facilities for the Horizon Mine is accurate and complete and all requirements of the Surface Mining Control and Reclamation Act, and the approved Utah State Program (the "Act") have been complied with. See Technical Analysis dated June 13, 2005 (R645-300-133.100)
3. The proposed lands to be included within the permit area are:
 - a. Not included within an area designated unsuitable for underground coal mining operation (R645-300-133.220);
 - b. not within an area under study for designated land unsuitable for underground coal mining operations (R645-300-133.210);
 - c. not on any lands subject to the prohibitions or limitation of 30 CFR 761.11 {a} (national parks, etc), 761.11 {f} (public buildings, etc.) and 761.11 {g} (cemeteries);
 - d. not within 100 feet of a public road except where the Consumer's Canyon road overlies a portion of the Beaver Creek Lease near the southwest boundary of the lease. In this case the road will be protected since, mining is not proposed to occur beneath the road. (R645-300-133.220); and
 - e. not within 300 feet of any occupied dwelling (R645-300-133.220).
4. The applicant has the legal right to enter and complete mining activities in the Beaver Creek Tract through the federal coal lease issued by the Bureau of Land Management. (See lease UTU-78404 document attached) (R645-300-133.300)
5. An assessment of the probable cumulative impacts of all anticipated coal mining and reclamation activities in the general area on the hydrologic balance has been conducted by the Division and no significant impacts were identified. See CHIA dated June 13, 2005. The Mining and Reclamation Plan (MRP) proposed under the revised application has been designed to prevent damage to the hydrologic balance in the permit area and in associated off-site areas. (R645-300-133.400 and UCA 40-10-11 (2)(c))
6. The operation would not affect the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitats as determined under the Endangered Species Act of 1973. See Technical Analysis dated June 13, 2005 and letter from the Fish and Wildlife Service dated May 9, 2005. (16 USC 1531 et seq.) (R645-300-133.500)

7. The Division's issuance of a permit is in compliance with the National Historic Preservation Act and implementing regulations (36 CFR 800). See Technical Analysis dated June 13, 2005 and letter from State Historic Preservation Office, dated June 10, 2005. (R645-300-133.600)
8. The applicant proposes acceptable practices for the reclamation of disturbed lands. The Division has determined that reclamation, as required by the Act can be feasibly accomplished following the approved plan as outlined in the PAP. See Technical Analysis dated June 13, 2005. (R645-300-133.710)
9. The applicant has demonstrated that all mine facilities and structures will comply with the applicable performance standards of R645-301. No special categories of mining are proposed so the R645-302 regulations do not apply. Addition of the remainder of the federal lease will not change the surface facilities being used at the mine. (R645-300-133.720 R645-300-133.740)
10. A 510 (c) report has been run on the Applicant Violator System (AVS), which shows that: prior violations of applicable laws and regulations have been corrected; neither Hidden Splendor Resources, Inc. or any affiliated company, are delinquent in payment of fees for the Abandoned Mine Reclamation Fund; and the applicant does not control and has not controlled mining operations with a demonstrated pattern of willful violations of the Act of such nature, duration, and with such resulting irreparable damage to the environment as to indicate an intent not to comply with the provisions of the Act (A 510 (c), see memo to file dated June 24, 2005. (R645-300-133.730)
11. The proposed postmining land-use of the permit area will remain the same as the pre-mining land use. (R645-300-133.750)
12. The applicant has posted a letter of credit and collateral as financial assurance for the Horizon Mine payable in the amount of \$342,000, and made payable to the Office of Surface Mining as well as the Utah Division of Oil Gas and Mining. (This needs to be done!!!) (R645-300-134)
13. No lands designated as prime farmlands or alluvial valley floors occur on the permit area. See June 13, 2005 Technical Analysis (R645-302-313.100 and R645-302-321.100)
14. The Division has made all specific approvals required by the Act, the Cooperative Agreement, and the Federal Lands Program.


Permit Supervisor


Permit Supervisor


Associate Director of Mining


Director

FEDERAL

**PERMIT
C/007/0020**

July 1, 2005

**STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING
1594 West North Temple
Suite 1210
Box 145801
Salt Lake City, Utah 84114-5801**

This permit, C/007/0020, is issued for the State of Utah by the Utah Division of Oil, Gas and Mining (Division) to:

**Hidden Splendor Resources, Inc.
50 West Liberty Street, Suite 880
Reno, Nevada 89501
(775) 322-0626**

for the Horizon No. 1 Mine. A financial assurance in the form of an Irrevocable Letter of Credit and Collateral (Real Estate) is filed with the Division in the amount of \$342,000.00, payable to the State of Utah, Division of Oil, Gas and Mining and the Office of Surface Mining Reclamation and Enforcement (OSMRE). The Division must receive a copy of this permit signed and dated by the permittee.

Sec. 1 STATUTES AND REGULATIONS - This permit is issued pursuant to the Utah Coal Mining and Reclamation Act of 1979, Utah Code Annotated (UCA) 40-10-1 et seq, hereafter referred to as the Act.

Sec. 2 PERMIT AREA - The permittee is authorized to conduct coal mining and reclamation operations on the following described lands within the permit area at the Horizon Mine situated in the State of Utah, Carbon County, as shown on Plate 1-1 (Permit Boundary Map) in the approved Horizon Mine mining and reclamation plan and located in:

Township 13 South, Range 8 East, SLM

Section 6 : NW1/4SE1/4, SE1/4SW1/4, SW1/4SE1/4. SE1/4SE1/4

Section 7: NW1/4, NE1/4, SE1/4, E1/2SW1/4, NW1/4SW1/4

Section 8: S1/2NW1/4, NW1/4NW1/4, SW1/4NE1/4, SW1/4, W1/2SE1/4

Section 17: NW1/4, W1/2NE1/4, NE1/4SW1/4, N1/2SE1/4SW1/4,
N1/2NW1/4SW1/4, NW1/4SE1/4, N1/2SW1/4SE1/4

Section 18: NE1/4NE1/4

The permittee is authorized to conduct coal mining and reclamation operations on the foregoing described property subject to the conditions of all applicable conditions, laws and regulations.

- Sec. 3 COMPLIANCE** - The permittee will comply with the terms and conditions of the permit, all applicable performance standards and requirements of the State Program.
- Sec. 4 PERMIT TERM** - This permit expires on October 11, 2006.
- Sec. 5 ASSIGNMENT OF PERMIT RIGHTS** - The permit rights may not be transferred, assigned or sold without the prior written approval of the Division Director. Transfer, assignment or sale of permit rights must be done in accordance with applicable regulations, including but not limited to 30 CFR 740.13{e} and R645-303-300.
- Sec. 6 RIGHT OF ENTRY** - The permittee shall allow the authorized representative of the Division, including but not limited to inspectors, and representatives of the Office of Surface Mining Reclamation and Enforcement (OSM), without advance notice or a search warrant, upon presentation of appropriate credentials and without delay to:
- (a) Have the rights of entry provided for in 30 CFR 840.12, R645-400-220, 30 CFR 842.13 and R645-400-110;
 - (b) Be accompanied by private persons for the purpose of conducting an inspection in accordance with R645-400-100 and R645-400-200 when the inspection is in response to an alleged violation reported to the Division by a private person.
- Sec. 7 SCOPE OF OPERATIONS** - The permittee shall conduct underground coal mining activities only on those lands specifically designated as within the permit area on the maps submitted in the approved plan and approved for the term of the permit and which are subject to the performance bond.

Sec. 8 ENVIRONMENTAL IMPACTS - The permittee shall take all possible steps to minimize any adverse impact to the environment or public health and safety resulting from noncompliance with any term or condition of the permit, including, but not limited to:

- (a) Any accelerated or additional monitoring necessary to determine the nature of noncompliance and the results of the noncompliance;
- (b) Immediate implementation of measures necessary to comply; and
- (c) Warning, as soon as possible after learning of such noncompliance, any person whose health and safety is in imminent danger due to the noncompliance.

Sec. 9 DISPOSAL OF POLLUTANTS - The permittee shall dispose of solids, sludge, filter backwash or pollutants in the course of treatment or control of waters or emissions to the air in the manner required by the approved Utah State Program and the Federal Lands Program which prevents violation of any applicable state or federal law.

Sec. 10 CONDUCT OF OPERATIONS - The permittee shall conduct its operations:

- (a) In accordance with the terms of the permit to prevent significant, imminent environmental harm to the health and safety of the public; and
- (b) Utilizing methods specified as conditions of the permit by the Division in approving alternative methods of compliance with the performance standards of the Act, the approved Utah State Program and the Federal Lands Program.

Sec. 11 EXISTING STRUCTURES - As applicable, the permittee will comply with R645-301 and R645-302 for compliance, modification, or abandonment of existing structures.

Sec. 12 RECLAMATION FEE PAYMENTS - The operator shall pay all reclamation fees required by 30 CFR Part 870 for coal produced under the permit, for sale, transfer or use.

Sec. 13 AUTHORIZED AGENT - The permittee shall provide the names, addresses and telephone numbers of persons responsible for operations under the permit to whom notices and orders are to be delivered.

- Sec. 14 COMPLIANCE WITH OTHER LAWS** - The permittee shall comply with the provisions of the Water Pollution Control Act (33 USC 1151 et seq.), and the Clean Air Act (42 USC 7401 et seq.), UCA 26-11-1 et seq., and UCA 26-13-1 et seq.
- Sec. 15 PERMIT RENEWAL** - Upon expiration, this permit may be renewed for areas within the boundaries of the existing permit area in accordance with the Act, the approved Utah State Program and the Federal Lands Program.
- Sec. 16 CULTURAL RESOURCES** - If, during the course of mining operations, previously unidentified cultural resources are discovered, the permittee shall ensure that the site(s) is not disturbed and shall notify the Division. The Division, after coordination with OSM, shall inform the permittee of necessary actions required. The permittee shall implement the mitigation measures required by the Division within the time frame specified by the Division.
- Sec. 17 APPEALS** - The permittee shall have the right to appeal as provided for under R645-300-200.
- Sec. 18 SPECIAL CONDITIONS** - The permittee shall comply with the special conditions in Attachment A.

The above conditions (Secs. 1-18) are also imposed upon the permittee's agents and employees. The failure or refusal of any of these persons to comply with these conditions shall be deemed a failure of the permittee to comply with the terms of this permit and the lease. The permittee shall require his agents, contractors and subcontractors involved in activities concerning this permit to include these conditions in the contracts between and among them. These conditions may be revised or amended, in writing, by the mutual consent of the Division and the permittee at any time to adjust to changed conditions or to correct an oversight. The Division may amend these conditions at any time without the consent of the permittee in order to make them consistent with any federal or state statutes and any regulations.

THE STATE OF UTAH

By: Paula Dupin-Zahn for John Baya
Date: 7/1/05

I certify that I have read, understand and accept the requirements of this permit and any special conditions attached.

PERMITTEE (Authorized Representative)

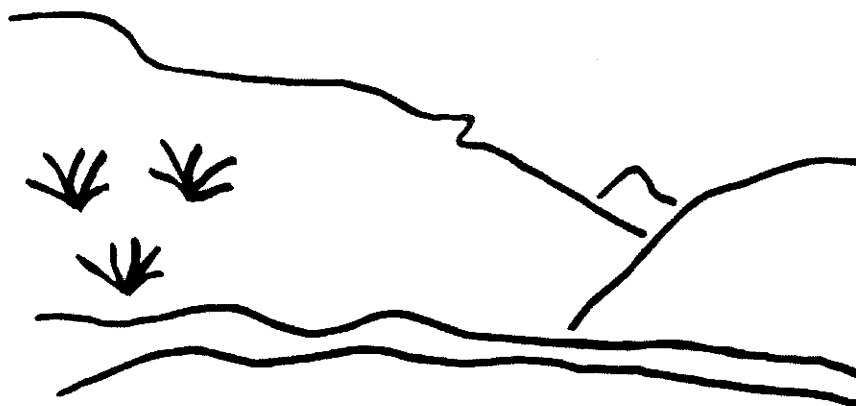
By: _____

Date: _____

Attachment A
Conditions

- Condition #1 Hidden Splendor Resources, Inc. will submit water quality data for the Horizon Mine in an electronic format through the Electronic Data Input web site, <http://hlunix.hl.state.ut.us/cgi-bin/appx-ogm.cgi>.
- Condition #2 Hidden Splendor Resources, Inc. may not commence coal mining and reclamation operations in federal coal lease U-74804 (north of Beaver Creek) until approval of the mining plan is authorized by the Assistant Secretary of the Lands and Minerals Management (ASLMM) in the Department of the Interior.

State of Utah



Utah Oil Gas and Mining

Coal Regulatory Program

Horizon Mine
Hidden Splendor Resources, Inc.
Technical Analysis
June 13, 2005

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TECHNICAL ANALYSIS DESCRIPTION

TECHNICAL ANALYSIS DESCRIPTION

The Division ensures that coal mining and reclamation operations in the State of Utah are consistent with the Coal Mining Reclamation Act of 1979 (Utah Code Annotated 40-10) and the Surface Mining Control and Reclamation Act of 1977 (Public Law 95-87). The Utah R645 Coal Mining Rules are the procedures to implement the Act. The Division reviews each permit or application for permit change, renewal, transfer, assignment, or sale of permit right for conformance to the R645-Coal Mining Rules. The Applicant/Permittee must comply with all the minimum regulatory requirements as established by the R645 Coal Mining Rules.

The regulatory requirements for obtaining a Utah Coal Mining Permit are included in the section headings of the Technical Analysis (TA) for reference. A complete and current copy of the coal rules can be found at <http://ogm.utah.gov>

The TA is organized into section headings following the organization of the R645-Coal Mining Rules. The Division analyzes each section and writes findings to indicate whether or not the application is in compliance with the requirements of that section of the R645-Coal Mining Rules.

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TECHNICAL ANALYSIS DESCRIPTION

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IDENTIFICATION OF INTERESTS

Regulatory Reference: 30 CFR 773.22; 30 CFR 778.13; R645-301-112

Analysis:

Chapter 1 of the federal lease application is an introduction describing where mining activities are currently located, and the location of the proposed federal lease addition, (plate 1-1). Over all changes to the current operation and reclamation plan are relatively minor.

Ownership and control information is in Chapter 2 and Appendix 2-4. Hidden Splendor Resources, Inc. is incorporated under the laws of the state of Nevada and is in good standing with legal corporate existence. Hidden Splendor Resources is also the Permittee and mine operator. Alexander H. Walker III is the resident agent and Cecil Ann Walker will pay the abandoned mine land reclamation fee. Officers of the Permittee are listed on page 2-2 of the permit. The MRP includes the MSHA numbers for the Horizon # 1 and Horizon # 2 Mines. (6/2/2005)

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations. When the application is at or near final approval an AVS check is recommended.

VIOLATION INFORMATION

Regulatory Reference: 30 CFR 773.15(b); 30 CFR 773.23; 30 CFR 778.14; R645-300-132; R645-301-113

Analysis:

Neither the Permittee nor any of its subsidiaries, affiliates or persons controlled by or under common control with the Permittee has had a federal or state permit revoked or suspended or revoked, nor forfeited a bond in the last five years as noted on page 2-6 of the permit. There are no outstanding notices of violation.

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Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

RIGHT OF ENTRY

Regulatory Reference: 30 CFR 778.15; R645-301-114

Analysis:

The U. S. Bankruptcy Court for the Eastern District of Kentucky assigned the right, title, and interest to the Horizon Mine to Hidden Splendor on March 24, 2003. Hidden Splendor has the right to enter and undertake coal mining based on the assignment from Lodestar by its Chapter 11 trustee, the designation of Operator executed by Lodestar and the federal coal lease. The Horizon mine was issued a Right-of Way SL 063011 through the BLM lands in 1966 to facilitate mining coal from fee lands. Documents pertinent to these actions are included in appendices 2-1 and 2-3. (6/2/2005)

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

LEGAL DESCRIPTION AND STATUS OF UNSUITABILITY CLAIMS

Regulatory Reference: 30 CFR 778.16; 30 CFR 779.12(a); 30 CFR 779.24(a)(b)(c); R645-300-121.120; R645-301-112.800; R645-300-141; R645-301-115.

Analysis:

The application includes the legal description and this matches the areas shown on the permit area maps. Copies of the leases for the areas proposed to be added to the permit area are located in Appendix 2-3. Page 2-7 of Chapter 2 describes the legal description of the permit boundary. On July 6, 2004 the Division received an "E" mail from Mr. Pappas noting the corrected legal description for the proposed public notice. The second parcel in Section 17 was changed from E1/2NE1/4 to W1/2NE1/4. The legal description in the application has been corrected also. Page 2-8 of Chapter 2 describes the status of unsuitability claims. The remaining portion of the lease is not within an area under study as an area designated as unsuitable for mining. There are no petitions filed with the D. O. G. M. that could affect the proposed lease application. As there is no surface disturbance associated with the mining of the additional lease

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area there will be no activities within 300 feet of an occupied dwelling or 100 feet from a cemetery. (6/2/2005)

The proposed operations will neither be within 100 feet of a public road nor within 300 feet of an occupied dwelling. Coal haulage at the existing mine is within 100 feet of a public road, but the plan contains approval letters from Carbon County regarding use of the public road. The letters are included in Appendix 3-1 and discussed in Chapter 3.

According to the current MRP and application, no portion of the area to be permitted is within an area designated as unsuitable for mining, (plate 1-1).

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

PERMIT TERM

Regulatory References: 30 CFR 778.17; R645-301-116.

Analysis:

The permit term is five years and the current permit expires October 1, 2006.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

PUBLIC NOTICE AND COMMENT

Regulatory References: 30 CFR 778.21; 30 CFR 773.13; R645-300-120; R645-301-117.200.

Analysis:

The application includes a copy of the proof of publication containing the required information. The advertisements ran from October 31, through November 21, 2000, in The Sun Advocate. A copy of the affidavit of publication was received December 4, 2000. On July 6, 2004 the Division received an "E" mail from Mr. Pappas noting the corrected legal description for the proposed public notice. For proof of publication a copy of the notice as published in the

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newspaper has been included in the application as Appendix 2-2 for the addition of the remaining portion of the federal lease. (6/2/2005)

No facilities would be used in common with any other permitted operation.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

FILING FEE

Regulatory Reference: 30 CFR 777.17; R645-301-118.

Analysis:

A copy of the filing fee is currently on file with the Division, there is no fee required for this revision to the operation and reclamation plan.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

PERMIT APPLICATION FORMAT AND CONTENTS

Regulatory Reference: 30 CFR 777.11; R645-301-120.

Analysis:

The application format and contents are in concert with the requirements and guidelines of the Utah Coal Regulatory Program.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

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REPORTING OF TECHNICAL DATA

Regulatory Reference: 30 CFR 777.13; R645-301-130.

Analysis:

Explicit citations in the References identify sources cited in the text. All referenced materials are available to the Division, although some must be obtained through the UGS library. (6/2/2005)

The Permittee's technical data have been analyzed under the requirements of the regulations.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

MAPS AND PLANS

Regulatory Reference: 30 CFR 777.14; R645-301-140.

Analysis:

The maps and plans provided in the application as required are prepared by a certified professional engineer to appropriate scale.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

COMPLETENESS

Regulatory Reference: 30 CFR 777.15; R645-301-150.

Analysis:

The information in the application was determined to be administratively complete on October 11, 2000. The Permittee has also stated in the application that the information is

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believed to be complete and correct. The application for the federal lease addition was determined Administratively Complete by the Division on June 28, 2004. (6/2/2005)

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

ENVIRONMENTAL RESOURCE INFORMATION

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

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Regulatory Reference: 30 CFR 783.12; R645-301-411, -301-521, -301-721.

Analysis:

The MRP includes a description of the existing, pre-mining environmental resources within the proposed permit area and adjacent areas that may be affected or impacted by the proposed underground mining activities. (6/2/2005)

Surface impacts are discussed but are not expected. As with all mining there exists the potential of mine subsidence that can migrate to upper geologic units and effect surface- and ground-water systems, which can in turn affect land use. The Permittee has submitted information that considers potential impacts and describes means and methods to prevent or mitigate impacts. Information pertaining to the surface disturbance, structures, and their reclamation is provided in the Horizon MRP.

Findings:

The Permittee has submitted information sufficient to evaluate the proposed area of mining and mining techniques and methods to conduct mining operations.

PERMIT AREA

Regulatory Requirements: 30 CFR 783.12; R645-301-521.

Analysis:

The permittee shows the new and old permit boundaries on Plate 1-1. Plate 1-1 shows the following:

- The old and new permit boundaries
- The disturbed area boundary
- Township, range and sections
- Topography (80-foot contours)

- Roads and stream

The permittee included a legal description of the permit area in Section 114 of the MRP. The legal description is identical to the leases areas. The permit area contains 1,577 acres. (6/2/2005)

In Section 117 of the MRP the permittee included a legal description of the disturbed area and acreage. The actual disturbed area contains 8.23 acres. The reclamation bond amount was calculated using 9.15 disturbed acres. The permittee agreed to continue to list 9.15 acres as the official disturbed acreage.

Findings:

Information provided in the proposed amendment is considered adequate to meet the requirements of this section.

HISTORIC AND ARCHEOLOGICAL RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.12; R645-301-411.

Analysis:

Appendix 5-1 contains the September 1995 "Historical, Cultural, and Paleontological Resource Study" by Baseline Data, Inc., and copies letters of concurrence from SHIPO dated May and October 1995. The Division has also received letters of concurrence from SHIPO dated June 10, 2005 in conjunction with mining in federal lease UTU-74804.

Findings:

Information provided in the proposed amendment is considered adequate to meet the requirements of this section.

CLIMATOLOGICAL RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.18; R645-301-724.

Analysis:

Climate is discussed in Chapter 11. The climate information in the plan was gathered the monitoring site of nearby Skyline Mine. The plan puts the respective average annual temperatures for 1993, at the Skyline Mine at 37.7°F. The respective cumulative annual

ENVIRONMENTAL RESOURCES INFORMATION

precipitation amounts for these same locations at 27.37 inches. The coldest month of 1993 was January, with an average temperature of -9°F, while the warmest month was August, with an average temperature of 80°F.

In the past the Division has recommended that the operator set up a weather station at the site so that precipitation events can be correlated with other monitoring data: this has not been done. (6/2/2005)

Findings:

The plan contains no site-specific climatological data, but an approximate range of data can be determined from the information scattered throughout the plan. The Division finds that this information meets the minimum regulatory requirements. The Division recommends, however, that the operator set up a weather station at the site so that precipitation events can be correlated with other monitoring data.

VEGETATION RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.19; R645-301-320.

Analysis:

Chapter 9 of the current operation and reclamation plan provides the vegetation resource information. Plate 9-1 depicting the vegetative communities and acreage has been updated to include the proposed permit area expansion. Vegetative communities include Oakbrush, Salina Wildrye, Maple/Oakbrush/Aspen, Fir/aspen, Alpine Herb/Grassland, Manzanita, and Sagebrush/grass/ Rabbitbrush. This information is adequate to predict the potential for reestablishing vegetation. Because there is no surface disturbance proposed with the mining in this area it is unlikely that there will be a need for reclamation practices to occur.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

FISH AND WILDLIFE RESOURCE INFORMATION

Regulatory Reference: 30 CFR 784.21; R645-301-322.

Analysis:

The Fish and Wildlife Information in the application is referenced in Section 3.6 et seq, and discussed in Chapter 10 of the current plan. Plate 10-1 has been revised to include the proposed addition to the permit area. This map shows the proposed permit boundary, the location of two raptor nests and big game habitat. The map has been revised to show the identification and location of the three nests located during the May 12, 2000 raptor survey. The proposed addition to the permit area is divided into critical year-long elk habitat and critical summer deer and elk habitats. There is an additional map labeled 2000 Raptor Survey Jump Creek Quad. The map has been identified as Appendix 10-3 in the table of contents of Chapter 10. There are three digit numbers associated with each of the nests shown on the map, 482-Golden Eagle-inactive, 484-Golden Eagle-old/dilapidated, 936-American Kestrel-active. The 2001 raptor survey is included in the 2001 annual report. It is labeled 2001 Raptor Survey-Horizon Mine, Jump Creek UT Quad. The map depicts the flight path of the survey that extends into and covers the majority of the proposed lease area. There were no nests identified in this area. The Division of Wildlife Resources (DWR) has provided the Permittee with a letter indicating that raptor surveys within the Horizon permit area were no longer necessary, (Appendix 10-3), Typically the Division requires a raptor survey current to the year of the permitting activity. In this case, because previous surveys have also shown no evidence of nesting raptors in the proposed lease area and the DWR supports no additional surveys, the 2001 survey would be sufficient. A copy of the letter from the DWR is included in the application. (6/2/2005)

Findings:

The information contained in this section of the application is adequate to meet the requirements of the regulations.

SOILS RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.21; 30 CFR 817.22; 30 CFR 817.200(c); 30 CFR 823; R645-301-220; R645-301-411.

Analysis:

Section 2.117 states that the disturbed area contains 8.23 acres. The bond covers 9.15 acres. The permit and disturbed area boundaries are shown in Plate 1-1.

Chapter 8 covers soil survey information. A soil survey was conducted in 1990. The survey was conducted by Richard Foster, of the SCS. A disturbed area soils map Plate 8-1 was drawn by Patrick Collins (Mt Nebo, Scientific).

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Plate 8-2 is a revised permit area soil map. The permit area boundary has been redrawn on this map to include federal lease UTU-74804.

Findings:

Information provided in the proposed amendment is considered adequate to meet the requirement of this section.

LAND-USE RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.22; R645-301-411.

Analysis:

The land use information is located in Chapter 4. Current land uses consist of grazing, logging, mining, mining reclamation activities, recreation and wildlife habitat. This permit application lies beneath an area that is undeveloped. The names, and addresses of the surface owners are provided and identified on plate 4-2. Plate 4-3 shows the ownership and location of the mineral tracts. The Permittee's legal right to enter is shown on plate 1-1 and discussed in the lease documentation located in Chapter 2.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

ALLUVIAL VALLEY FLOORS

Regulatory Reference: 30 CFR 785.19; 30 CFR 822; R645-302-320.

Analysis:

Alluvial Valley Floor Determination

There is a letter in Appendix 7-6 from SCS dated 6/13/80 stating that there are no Alluvial Valley Floors in the area of Section 17, Township 13 South, Range 8 East. As this letter does not cover the revised permit area and as the Alluvial Valley Floor determination is the responsibility of the Division, the issue will be addressed here, on the basis of the information provided in the application. The additional lease area falls within Sections 7 and 8 on the north and Sections 18 and 17 on the south. The additional lease area is at an elevation of 7600 - 8400 feet and is bordered by Beaver Creek on the north. Beaver Creek lies in Sections 7 and 8.

The soil type along Beaver Creek at 8,300 ft elevation is #109 Silas-Brycan loams. The following soil description comes from the SCS Soil Survey¹: these soils are found in low areas adjacent to stream channels or on alluvial fans adjacent to narrow alluvial valleys. The water table fluctuates between 20 - 25 inches.

Surface mining will not be conducted in the area. The premining land use has been undeveloped rangeland utilized for grazing and the deposits of alluvium are small and do not support farms.

In accordance with R645-302-323, the Division finds that the premining land use is undeveloped rangeland which is not significant to farming and that the area of alluvium is small.

Applicability of Statutory Exclusions

Findings:

The permittee has submitted sufficient information to address this section.

PRIME FARMLAND

Regulatory Reference: 30 CFR 785.16, 823; R645-301-221, -302-270.

Analysis:

The additional lease area is at an elevation of 7,600 – 8,400 ft and is bordered by Beaver Creek on the north, Gordon Creek on the south and is bisected by Jewkes Creek. In Figure 8-1, the prime farmland determination dated 9/12/1990 by the Soil Conservation Service states that there are no prime farmlands within Sections 7, 8, 17, 18 or 20 of Township 13 South, Range 8 East. The area covered in the lease application extends into Sections 7 and 8 on the north and Section 18 on the south.

The soils within the lease are were designated #107 (Shupert-Winetti complex) along Jewkes Creek, and #72 (Pathead/Curecanti family association) on the south facing slopes, #63 (Midfork family Podo association) on the north facing slopes and #109 (Silas-Brycan loams) in the Beaver Creek drainage with #124 on the north facing slopes and #72 on the south facing slopes.

¹USDA. SCS. 1988. Soil Survey of Carbon Area, Utah.

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Soil type #107 is deep and well drained. The mine surface facilities are located within this soil type.

Findings:

The application provides the required information.

GEOLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR 784.22; R645-301-623, -301-724.

Analysis:

Chapter 6 includes the geologic information for the Horizon Mine area in accordance with the requirements set forth in R645-301-600. The permittee has submitted a stratigraphic column in Table 6-1. (6/2/2005)

Previously assembled geologic data obtained from Beaver Creek Coal Co. has been used as a basis for this chapter. The data from Beaver Creek Coal Co. included drill logs generated during their mining efforts. Information from recent geologic publications and in-house reports is also included to supplement the information obtained from Beaver Creek Coal Co. (6/2/2005)

The current coal mining plan includes geologic information in sufficient detail to assist in determining: the probable hydrologic consequences (PHC) for the operation. The PHC determination is required from the operator to identify potential impacts to the quality and quantity of surface and ground water in the permit and adjacent areas. identify where surface- and ground-water monitoring is necessary; whether reclamation can be accomplished; whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area; and provide information to prepare a subsidence control plan. (6/2/2005)

The minable seams for the area are found in the lower 350 feet of the Blackhawk Formation. Plates 6-2 and 6-3 are geologic cross-sections that illustrate the stratigraphic relationships of the Blackhawk and Star Point Formations and the mappable coal beds present in the Horizon No. 1 Mine area. (6/2/2005)

A total of eight coal seams can be identified in the Gordon Creek region; however, Hidden Splendor has plans to mine only the Hiawatha seam. Four of the eight seams are present in the mine area and outcrop on the walls of the North Fork of Gordon Creek Canyon, Coal Canyon, and Bryner Canyon. Weathering, burning and vegetation obscures the majority of coal outcrops of the Hiawatha, Gordon, Castlegate "A", and Bob Wright seams. Only the Hiawatha and Castlegate "A" Seams have been economically mined in the area. The Hiawatha seam marks the base of the Blackhawk Formation. The Castlegate "A" seam overlies the Aberdeen

Sandstone. The Aberdeen is a marine sandstone sequence that coarsens upward, and is similar in character to the Star Point Sandstone. The Aberdeen measures over 120 feet at Price Canyon (Sec. 12, T13S, R9E) and thins to the west. In the vicinity of the Horizon No. 1 Mine and the National Mine (Sec. 17, T13S, R8E), the Aberdeen Sandstone is apparently discontinuous and not easily recognizable on outcrop. The westward pinch-out of the Aberdeen Sandstone is illustrated on the west-east stratigraphic section between drill hole LMC-4 and the Arco measured section near the National Mine as illustrated on Plate 6-3. (6/2/2005)

Acid- and Toxic-forming Materials

Table 6-5 summarizes the quality of the Hiawatha coal seam. The analyses were performed on core samples from drill hole LMC-4 as well as the HZ drill holes. Supporting laboratory data sheets are provided in Appendix 6-2. (6/2/2005)

According to data provided in Table 6-5, the average moisture content of the Hiawatha coal seam is 7.99 percent. The pyritic sulfur content of the coal is low, with a maximum of 0.07 percent and an average of 0.05 percent. (6/2/2005)

Data presented in Appendix 6-2 and summarized in Table 6-6 indicate that the Hiawatha coal seam does not possess toxic-forming characteristics. Boron and selenium concentrations, as well as sodium adsorption ratios, are all within a range classified as "good" by Leatherwood and Duce (1988). However, the acid-base potential of each of the three coal samples, which were collected from the HZ-series drill holes suggest that the coal has a potential to be acid-forming. (6/2/2005)

The acid-forming potential of the coal will be tempered by its slightly alkaline nature (with a pH that varies from 7.3 to 7.8, according to Appendix 6-2). Furthermore, impacts to the environment of the permit and adjacent areas resulting from this acid-forming potential will be minimized by two factors. First, coal will be stored on the surface for only short periods of time before being shipped off site, thus reducing the potential for weathering, oxidation, and generation of acid drainage. Second, runoff from the coal stockpile will be routed through the facility sedimentation pond, where it will mix with more-alkaline runoff from additional areas, thus neutralizing any acidic drainage, which might form. (6/2/2005)

Table 6-6 lists the analytical results of tests performed to determine the acid- and toxic-forming potential of floor and roof samples collected adjacent to the Hiawatha coal seam from LMC-4 and from the HZ holes. Comparing the data in Table 6-6 with the guidelines presented by Leatherwood and Duce (1988) indicates the roof and floor materials should be neither acid-generating nor toxic-forming. One sample (LMC-4 roof material) did contain an anomalous-high pyritic sulfur content of 0.24 percent. However, comparison with other samples collected in the area indicates that this high pyritic sulfur content is likely of limited areal extent. This is further verified by the high neutralization potential of the remaining roof and floor materials (with acid/base potentials varying from 20.3 to 64.0 tons of CaCO_3 per 1000 tons of material). (6/2/2005)

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To monitor conditions of the overburden and underburden, samples will be taken at 2,000 ft intervals throughout the mine and will be tested according to the Divisions requirements. (6/2/2005)

Roof and Floor Properties

As discussed in Section 6.5.2, the roof and floor rock of the Castlegate "A" and Hiawatha seams varies from shale to competent sandstone. Information obtained from the LMC drill holes and selected drill holes from the Beaver Creek Coal Company permit application for their mines in the area have been utilized to determine roof and floor conditions that can be anticipated while mining the Hiawatha seam. The location of the of the Beaver Creek drill holes are included on Plate 3-3. Logs of the wells used to determine the properties of the roof and floor rock are included in Appendix 6-1. (6/2/2005)

The logs of drill hole LMC-3 and LMC-4 indicate the floor rock of the Hiawatha consists of five feet of carbonaceous silty shale and silty sandstone overlying the massive sandstone of the Spring Canyon Member of the Star Point Formation. No cores were obtained from LMC-3 and LMC-4 to determine the geotechnical properties of roof or floor rock. Uniaxial strength tests were performed by Beaver Creek Coal Company on samples of shales and sandstones obtained from drill holes GCD-4, 7, and 10. These drill holes are located approximately one mile west-southwest of the Horizon Mine portals. The results of the tests are provided in Table 6-7. (6/2/2005)

The logs from drill hole LMC 1 indicate the roof of the uppermost split of the Castlegate "A" seam is approximately 35 feet of sandstone. The floor of the seam consists of four feet of shale overlying approximately 30 feet of sandstone. In LMC-2, the upper split roof rock consists of 42 feet of carbonaceous shale and the floor consists of 38 feet of shaley silty sandstone. In LMC-3, the upper split roof rock consists of 4.5 feet of shale overlain by 19 feet of silty sandstone and the floor rock consists of four feet of shale overlying 8.5 feet of sandstone. In LMC-4, the roof rock consists of 15 feet of sandstone and the floor rock is five feet of siltstone overlying 26 feet of sandstone. Information from Beaver Creek Coal Company GCD-4 indicates that the roof rock of the Castlegate "A" seam in the area of the drill hole consists of sandstones interbedded with shales and the floor consists of shale. The results of uniaxial strength tests for samples obtained from the roof and floor rock of the Castlegate "A" seam in drill hole GCD-4 is provided in Table 6-7. (6/2/2005)

Drill Holes

The Permittee has provided information from several boreholes on and adjacent to the permit area. Drill holes were drilled by Beaver Creek Coal Company to garner data for coal reserves. Drill Hole logs are provided in Appendix 6-1.

Stratigraphy

The Permittee has described the stratigraphy in Section 6.4 of the MRP. The description includes the area on and adjacent to the mine. The stratigraphy consists of:

Star Point Sandstone

The Star Point Sandstone is the oldest stratigraphic unit exposed in the lease areas. It is the basal unit of the Mesaverde Group and is approximately 440 feet thick. The formation contains the Panther, Storrs, and Spring Canyon Sandstone Members which consist of coarsening upward littoral sequences of white to light gray, fine to medium grained, tight, quartzose sandstone (Blanchard 1981). The Star Point Formation overlies and intertongues with the marine Mancos Shale. The Star Point is the lowest cliff-forming unit over most of the east side of the Wasatch Plateau.

Blackhawk Formation

The Blackhawk Formation measures approximately 900 feet thick in the Gordon Creek area and consists of interbedded fluvial and marine sandstone, siltstone, and shale. The Blackhawk Formation conformably overlies the Star Point Sandstone and the boundary between the two formations is sharp; the massive Spring Canyon Sandstone member of the Star Point Sandstone is overlain by an erodible, shaley sandstone.

In the lease area, the Blackhawk Formation is the principal surficial bedrock unit. The Blackhawk disconformably overlain by the massive coarse grained, fluvial Castlegate Sandstone. A total of eight coal seams can be identified in the Gordon Creek region. Four of the eight seams are present in the mine area and outcrop on the walls of the North Fork of Gordon Creek Canyon, Coal Canyon, and Bryner Canyon.

Weathering, burning and vegetation obscures the majority of coal outcrops of the Hiawatha, Gordon, Castlegate "A", and Bob Wright seams. Only the Hiawatha and Castlegate "A" seams have been economically mined in the area. The Hiawatha seam marks the base of the Blackhawk Formation. The Castlegate "A" seam overlies the Aberdeen Sandstone. The Aberdeen is a marine sandstone sequence that coarsens upward, and is similar in character to the Star Point Sandstone. The Aberdeen measures over 120 feet at Price Canyon (Sec. 12, T13S, R9E) and thins to the west. In the vicinity of the Horizon No. 1 Mine and the National Mine (Sec. 17, T13S, R8E), the Aberdeen Sandstone is apparently discontinuous and not easily recognizable on outcrop. The westward pinch-out of the Aberdeen Sandstone is illustrated on the west-east stratigraphic section between drill hole LMC-4 and the Arco measured section near the National Mine as illustrated on Plate 6-3.

Castlegate Sandstone

The Castlegate Sandstone is exposed in the central and northeastern portion of the lease block (Plate 6-1). The formation consists of a white to gray, coarse grained to conglomeratic fluvial sandstone. Exposures of the Castlegate Sandstone typically form cliffs to steep slopes. The Castlegate Sandstone is approximately 300 feet thick in the Gordon Creek area.

Price River Formation

ENVIRONMENTAL RESOURCES INFORMATION

The Price River Formation occurs in the northeastern portion of the lease block (Plate 6-1). The Price River is also a fluvial deposit and contains gray to white silty sandstones with interbedded subordinate shale and conglomerate. The formation typically forms ledges and slopes. The Price River formation ranges from 600 to 1,000 feet in thickness.

Unconsolidated Deposits

Unconsolidated deposits composed of silt and fine-grained sand, alluvial sediments and talus debris occur along valley floors and at the base of steep slopes. The thickness of these sediments is variable. In the Horizon No. 1 Mine area, the thickest alluvial deposits occur along Beaver Creek. Based on field observations, the alluvial sediments appear to exceed 10 feet in thickness.

Structure

Figure 6-3 shows data of a dip slope from the top of the Spring Canyon Member of the Star Point Sandstone to the north-northeast. The area around the minesite is dissected by several faults. There are two graben zones, the Gordon Creek Graben and the Fish Creek Graben. These grabens run parallel and converge into N-S trending faults of the North Gordon Fault zone. The proposed mine expansion will take place in the Fish Creek Graben Zone. According to Figure 6-3 any buildup of mine water may flow out the portal.

Several igneous dikes have been reported in area mines including the Beaver Creek Coal Mines #2 and #3. The dikes are reported to be Miocene age and are a mica peridotite (Tingey, 1986). The dikes are typically associated with faults that bisect the area and trend east-west to northwest-southeast.

Faults

The area of the permit is heavily faulted (Plate 6-1). Two major fault zones affect the lease block: the North Gordon and Fish Creek fault zones (Figure 6-2). The North Gordon fault zone measures three miles wide and five miles in length and is located east of the lease. The Fish Creek fault zone averages two miles wide and enters the lease from the northwest.

The permit area contains essentially two major fault trends. They are the N60 degree west trending faults (Range N50-75W) associated with the Fish Creek fault zone, and the N-S trending faults associated with the North Gordon fault zone. Sympathetic faulting also occurs within the mine area. Displacements of the faults in the mine area are variable ranging from a few feet to as much as 200 feet. (6/2/2005)

The permittee has not requested that the Division waive in whole or in part the requirements of the borehole information or analysis required of this section.

Findings:

The Permittee has submitted sufficient Geologic Resource Information to meet the minimum requirements if the regulations.

HYDROLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 701.5, 784.14; R645-100-200, -301-724.

Analysis:

Sampling and Analysis

The operator is required to perform all sampling and analysis in a manner that meets the requirements of R645-301-723.

The ground-water, surface-water, and point-source discharge site monitoring will be conducted in accordance with 40 CFR Parts 122 and 123, R645-301-751 and as required by the Utah Division of Water Quality for Utah Pollutant Discharge Elimination System (UPDES) permits. A UPDES discharge permit application has been secured from the Division of Environmental Health for the sediment pond and mine water discharge for the Horizon Mine operation. The UPDES permit for the Horizon Mine is provided in Appendix 3-6.

When analysis of any surface water sample indicates non-compliance with the permit conditions, the company will promptly notify the Division and immediately take actions to identify the source of the problem, correct the problem and, if necessary, to provide warning to any person whose health and safety is in imminent danger due to the non-compliance.

Baseline Information

Baseline hydrology was based on the Permittee's review of literature and available data obtained from the USGS, the US Forest Service, the State of Utah, Beaver Creek Coal Company, Blue Blaze Coal Company, and mine permit applications for the surrounding mines. Water quality data have been collected from the permit and adjacent areas since 1989. Water monitoring points are shown on Plate 7-1. Ground-water baseline data are in Appendix 7-2 and surface-water baseline data are in Appendix 7-3. Operational water monitoring data are in the Division's database. (6/2/2005)

Within the permit area, the surface water resources consist of streams, springs, wells and ponds. The mine is established in Portal Canyon, an ephemeral drainage, yielded only occasionally flows until the mine started discharging water. Portal Canyon drains into Jewkes

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Creek. The undisturbed runoff generated above the disturbed area is directed into a 36-in culvert, UC-2, that runs the length of the disturbed area in Portal Canyon. Mine water is discharged directly into the Portal Canyon culvert.

Jewkes Creek is a perennial stream which receives its flow from rainfall, snowmelt and springs SP-1 and SP-4. Spring Two Canyon, a tributary to Jewkes Creek occasionally contributes flow. Part of the disturbed area lies along Jewkes Creek. Another set of undisturbed 36-inch drainage culverts, UC-1 and UC-3, directs flows from Jewkes Creek under the disturbed area and under the sedimentation pond. Drainage diversions are shown on Plate 7-4.

Beaver Creek is a perennial stream which lies in a drainage opposite the ridge of Jewkes Creek. Its flow path bisects the federal coal lease. Although the current mine plan does not extend across Beaver Creek, the operator has intentions of conducting future mining operations in the federal coal lease beyond Beaver Creek. The area surrounding Beaver Creek is privately owned and some concerns regarding subsidence and water interception have been expressed by the landowner.

There are several springs in the vicinity of Beaver Creek. Perennial and intermittent springs appear above of the mine area. Springs occur where the recharge potential from alluvium and sandstone units in the Price River Formation and Castlegate Sandstone is high or from fractures created by faulting. Ephemeral springs tend to be linked to shallow aquifers consisting of soils, alluvium or colluvium.

Generally, there is flow in Jewkes Creek and Beaver Creek throughout the year. Several of the adjacent canyons contain flows during the spring snowmelt runoff period and also as a result of isolated summer thunderstorms. Due to the limited drainage area and high elevation of some of the canyons the duration of the snowmelt flow is short and limited to the very early spring. Locations of all baseline water data points are shown on Plate 1. Baseline data information is included in Appendix 7-1.

Plate 7-1 shows numerous springs and seeps exist within, and adjacent to, the permit area, especially in the Beaver and Jump Creek area. Based on results of the PHC determination, base-line study and other available information, the operator will monitor the significant surface water sources, including drainages above and below the disturbed mine site area, and all point-source discharges.

The operator has provided information on water rights included in Appendix 3-5. The points of diversion for water rights near the mine operations are presented on Plate 7-3. Designated uses and season of use for some water rights are not included in the water rights table provided. The operator has indicated that the area is almost exclusively used for stock watering.

Figures 7-2, -2A, and -2B represent the potentiometric surface as it was in December 1995, September 1996, and June 2002. (6/2/2005)

Ground-water information

Seeps, springs and potential mine water discharge will be monitored in accordance with the Ground-water Monitoring Plan in Chapter 7.

Section 6.4.1 discusses site stratigraphy and provides information relative to ground water in relation to the mine operations. Section 7.1.2 discusses the ground-water resources. The operator provides Figure 7-4 to delineate potential recharge areas.

Local Drilling Information and Occurrence of Ground Water

Information regarding baseline ground-water data collection is discussed in Chapter 7, Section 7.1.2.2. Four exploratory holes drilled in 1970's and 1980's were monitored for water in 1995. Drill logs of Holes LMC 1, LMC 2, LMC 3, and LMC 4 are found in Appendix 3A. Also, three wells were drilled and completed in the Star Point Spring Canyon Sandstone in 1995. Documentation of the LMC drilling procedure was provided in a notarized letter from Mr. Joseph A. Harvey to Rich White, Engineering Consultant for Horizon Mine, on March 24, 1992 (Appendix 7-1). Section 6.5.1.1 states that Drill holes LMC-1, LMC-2 and LMC-3 will be plugged and abandoned following State approved methods. [06/02/2005]

Previous Mining History

Plates 3-9 and 3-10 show the location and extent of known workings of active, inactive, or abandoned underground workings, including openings to the surface, within the permit and adjacent areas; also, areas within these mines that have been second mined. [06/02/2005]

Springs

The PAP indicates baseline reconnaissance information was gathered in the field with an Oil, Gas and Mining employee named Darin Worden from 1988 to 1990. Other information was derived from state and federal published open file reports. A complete spring and seep survey in the proposed permit and adjacent area was not conducted. Currently the PAP does not contain a map showing spring locations in the permit and adjacent area.

The baseline sampling information is gathered from springs that issue from the Blackhawk Formation and were characterized as Calcium Bicarbonate type waters.

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Table 2.3

Baseline Spring Sampling Summary

(Summary of information from Plate 7-1, Figure 7-3 and Sections 7.1.3, 7.1.5 and 7.2.6)

Sampling Point	Monitoring History	Location (Formation)	Water Quality	Water Quantity	Comments
SP-1 1989 to present	Station #1 1989 through 1993	Issues from Hillside and flows into Jewkes Creek (Blackhawk Sandstone unit above coal seams 8195 ft msl.)	TDS 230-330 mg/l pH 7.5 - 8.5	Late Spring 10-15 gpm High flow on 5/89 was 45 gpm Late Summer/Fall 5 to 6 gpm	
SP-2 1989 to present	Station #2 1989 through 1993 (This description matches the station number 1 previously; Channel in North Fork of Gordon Creek.)	Issues from Hillside and usually flows approximately 100 feet (Blackhawk, 8005 ft msl)	TDS 480-540 mg/l pH 7.5 - 8.5	Flow in Late Spring 1-2.5 gpm Flow in Late Summer/Fall <1 gpm Dry 7/1991, 8/1991, through 12/1992	Spring flows through alluvium below the point of origin.
SP-4 1989 to present	#4 1989 through 1993	Jewkes Creek Drainage flows along road empties into Jewkes Creek (Blackhawk, 8102 ft msl)	TDS 350-480 mg/l pH 7.5 - 8.5	Flow in Late Spring 1-2.25 gpm Flow in Late Summer/Fall <1 gpm	Location not clearly mapped
SP-6 1989 to 1995	#6 1989 to 1995	Upstream from the proposed mine portal (Blackhawk)	N/A	dry from 1989 through 1995	This location is not a spring and will not be included in future monitoring

not found	Gunnison Homestead Spring/Tributary to Beaver Creek near confluence of spring discharge channel and Beaver Creek	(Blackhawk)	not discussed	3-136 gpm the 136 gpm included snowmelt runoff.	Location removed from Figure 7-3
SP-9	Jewkes Spring U.S.G.S. 1979-1983 Station 2-5-W Beaver Creek Coal Company 1985-1995	Near Beaver Creek Channel, south west corner of proposed LOM permit area. (Blackhawk, 8550 ft msl)	TDS 240-300 mg/l pH 7.5 - 8.5	Typical Late Spring flow 20 to 60 gpm decreasing late fall 1.10 to 38 gpm (Maximum flow on 7/85 was 1372 gpm considered inaccurate)	Location mapped on Figure 7-3 Information on flow discussion in Section 7.2.2.2 varies from Section 7.1.2.2

In Section 6.4.2 the operator has indicated a series of springs in the North Fork of Gordon Creek in the northwest corner of Section 18 T13S R8 E may be related to faults bisecting the area. The North Fork drainage may have formed subsequent or contemporaneously with the movement along the Gordon Creek Fault Zone.

The operator has stated the Homestead Spring is one of the main contributing springs to Beaver Creek. However, the operator has not included this spring in the baseline or operational monitoring regime. The operator has identified this spring as important to Beaver Creek flows, but has not indicated why the spring should not be part of a sampling point (i.e.; why is this spring considered outside the zone of potential impact?).

Ground-water Quality

Two water quality samples were collected in the Blue Blaze No. 1 Mine workings, one in May 1992 and one in November 1995. The water was determined to be a calcium bicarbonate type with TDS ranging from 414 to 452 mg/l and pH from 6.8 to 7.66.

Ground water collected from the HZ wells in December 1995, November 1996, and January 1996 may have been somewhat affected from the foam drilling fluid used during installation. Data analyses indicate TDS ranged from 380 to 680 mg/l. Due to the potential effects from the foam drilling additional water quality data is necessary.

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Surface-water information

The Horizon Mine lies within the headwater streams of the Price River Basin. Major drainages within the permit and adjacent area are; Beaver Creek north of the mine site, and the North Fork of Gordon Creek and Gordon Creek south of the mine site. The disturbed area drains into the North Fork of Gordon Creek. The State Division of Water Quality classifies Gordon Creek as Class 3C and Class 4 waters. These classifications are designated as non-game and aquatic life, and agricultural uses, respectively. Beaver Creek, located over the future proposed mine workings, is classified as 1C and 3A, designated as domestic and agricultural uses respectively. Down stream of the proposed disturbed area in Gordon Creek there are fisheries. Information on the fisheries is lacking in the plan. For further discussions see the **Fish and Wildlife** sections in this TA.

Drainages adjacent to the proposed disturbed area are named for referencing purposes as shown on Plate 7-4. The following designated names are assigned for the drainages flowing through the proposed disturbed area:

- 1) Jewkes Creek - the main drainage through the site which joins the North Fork of Gordon Creek's main stem at the southern boundary of the permit area.
- 2) Portal Canyon - this drainage is the first drainage entering from the west after crossing the permit area boundary and joins Jewkes Creek. The portal entries are located in this drainage.
- 3) Spring Two Canyon - is the second drainage entering from the west after crossing the permit area boundary and joins Jewkes Creek. This drainage is upstream of the disturbed area.

Streams within the permit area receive their maximum flows in late spring and early summer as a result of snowmelt runoff. Flows decrease significantly during the autumn and winter months. Jewkes Creek has experienced no flow during the winter and late summer months.

Beaver Creek is a perennial stream with base flow maintained by seeps and springs. Beaver ponds are common in Beaver Creek and also play a part in providing perennial flows. Springs contributing to base flow include the Gunnison Homestead Spring, within one mile west of the proposed additional lease area, and Jewkes Springs one mile west of the permit area near the north west corner. Discharges from these springs vary between 3 to 136 gpm and 1.1 to 38 gpm respectively.

The USGS maintains a gauging station (09312700) near the mouth of Beaver Creek several miles northeast of the permit area with a period of record from 1960 through 1989. The

minimum annual discharge for this period was 338 acre-feet in 1961. The maximum annual discharge of 1,610 occurred in 1973. The average annual discharge for the 29-year period of record was 3,310 acre-feet. Decreases in downstream flow are observed in Beaver Creek between monitoring stations SS-7 and SS-8. The decrease is most prevalent during the low flow season. This losing stream section may occur due to either alluvium, fracture and fault systems or other unknown factors.

The operator discusses the annual variability of flow in Beaver Creek. Although there is annual variability, the variability in base flow related to snowfall and possibly spring run off would provide more significant information. Snowmelt survey and precipitation information, where available, should be used to compare annual base flow changes with the precipitation rates.

Jewkes Creek drains a watershed area slightly greater than 1 square mile and discharges to the North Fork of Gordon Creek. The operator has referred to this stream as intermittent. The flow data submitted indicate that normally the creek flows all year at Sampling Point 5, but becomes intermittent at Sampling Point 3. The flow diminishes in a downstream direction beyond sampling point SS-5, infiltrates into the alluvium and does not reappear immediately downstream according to information in the PAP. Water may reappear one half mile down stream in the North Fork Gordon Creek where the Mancos shale outcrops. A potential reason for the diminished flows in this area may be due to recharge of subsurface soils in the riparian area near this monitoring site. Characterization, by collecting water quantity data and by observation in the North Fork of Gordon Creek, to determine whether this stream re-emerges as constant flow downstream should be made.

The North Fork of Gordon Creek flows along County Road 290 southeast of the permit area. The elevation of the creek is lower than the Hiawatha coal seam. The operator suggests the mining of the Hiawatha would not affect the quantity or quality of flow in the North Fork of Gordon Creek. However, the operator has shown the Spring Canyon Aquifer below the Hiawatha coal seam contains water and mining might reduce the piezometric water elevation potentially affecting the surface water in this stream. Discharge from the Star Point Sandstone to this stream section should be determined. Losing and gaining reaches in this section of the stream should be identified.

The proposed Five Year Mine Plan as shown on Plate 3-3, illustrates a proposed lease area to the north and east of the currently designated permit area. The surface water descriptions and baseline information for the permits adjacent area have not been presented. The Operator's future mining operations are proposed to take place under Sand Gulch and an unnamed drainage to the north. No baseline information was collected for this area. In addition, Plate 3-3 shows the major fault systems which run northeast and southwest of the proposed mine operations. This fault system should be used to describe the geologically defined adjacent area. The graben and fault system appears to extend all the way up to Jump Creek. Additional baseline

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information will be necessary to permit this site in the future and may be necessary to complete the CHIA. Further baseline sampling should focus on the springs and surface waters potentially impacted through intercepting water from faults and fractures and diverting. Baseline information should extend to Jump Creek until adequate information is supplied to the Division to consider Jump Creek outside of the adjacent area.

Table 2.4

Baseline Surface Water Sampling

Sampling Point	Location	Flow	Water Quality	Comments
#3 1993 through 1995	Channel in Jewkes Creek /below disturbed area upstream of the intersection with the North Fork of Gordon Creek and below the surface facilities.	Intermittent	TDS 388 to 799 mg/l. Total Fe <0.02 to 8.7 mg/l Total Mn <0.01 to 0.05 mg/l TSS <1 to 72 mg/l pH 6.25 to 9.5	Information presented in the text does not match the data in appendices
#5 1993 through 1995	Jewkes Creek upstream of disturbed area but downstream of the confluence with Spring Two Canyon.	Perennial	TDS 198 to 550 mg/l. Total Fe .05 to 3.9 mg/l Total Mn 0.05 to 1.0 mg/l TSS 1 to 245 mg/l pH 6.7 to 8.99	Information presented in the text does not match the data in appendices
#6 1991 through present	Right Fork North Fork Gordon Creek In the east Drainage above proposed portals and disturbed area	Ephemeral	Removed from proposed monitoring schedule. Samples were never obtained.	This should be monitored on the same day as sites 3 and 7 when sampling during a precipitation event or snowmelt period

#7 1991 through present	Beaver Creek above pond upstream of the proposed future permit area outside of potential subsidence zone?.	Perennial	TDS 216 to 353 mg/l. Total Fe 0.05 to 5.19 mg/l Total Mn <0.1 to 0.19 mg/l TSS <1 to 297 mg/l pH 6.0 to 8.54	Beaver Creek tends to have a lower TDS than Jewkes Creek.
#8 1991 through present	Beaver Creek station downstream, does not appear to be downstream of potential impact area for future mine plan.(see Plate 3-3 and 7-1).	Perennial	TDS 192 to 357 mg/l. Total Fe <0.02 to 1.3 mg/l Total Mn <0.01 to 0.078 mg/l TSS 4.0 to 52 mg/l pH 6.6 to 8.69	Flows tend to be lower than the upstream Beaver Creek station. Located near the Fault system.
2-2-W	Gordon Creek above confluence of North Fork Gordon Creek below the Hiawatha	Perennial	Not discussed.	Impact more likely to be below confluence because of fracture system.
2-3-W	Beaver Creek	Perennial	Not discussed	Monitored by Beaver Creek Coal. Not found on any map
2-4-W 1982-	Beaver Creek 1 -1/2 mile west of permit area	Perennial	Not discussed	Monitored by Beaver Creek Coal.

The operator has not adequately discussed the variation in the data presented as baseline information. Data presented in the text does not reflect data presented in the appendices.

Baseline Cumulative Impact Area Information

The Utah Division of Oil, Gas, and Mining has prepared a CHIA. The last CHIA for the area was prepared February 23, 2001, then updated September 2004 and again in June 2005. In addition to reference sources cited, information has been garnered from the Horizon, Gordon Creek #2, #7 and #8, and Gordon Creek #3 and #6 Mining and Reclamation Plan (MRP), as well as U. S. Geological Survey and Utah Geological Survey hydrologic and geologic reports.
[06/02/2005 JDS]

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Modeling

Actual surface- and ground-water information is supplied in this application; therefore, modeling is not proposed. No surface water modeling has been conducted.

Alternative water source information

In Section 7.1.6 the operator purports no significant impacts are foreseen to ground water as a result of mining in the permit area. In Section 3.4.3, page 3-18, the operator states, "As noted in Section 7.1.6, alternative sources will be developed and provided if water rights or uses are affected by mining operations", however, no discussion on alternative sources were presented in this section. Section 3.4.3 states, "Should Horizon's mining activities cause an adverse impact on the areas water supply, the operator intends to mitigate the effects. The mitigation will be negotiated between Horizon and the injured party".

Because "Alternative Water Source Information" applies to Surface Mining and Reclamation activities under R645-301-727 there are no requirements under this regulation as it applies to underground mining. However, the operator is required to notify the Division of Oil Gas and Mining when analysis of any ground-water or surface-water sample indicates non-compliance with the permit conditions, which include the performance standards under 752.220 through 752.250. The Division of Water Rights and other agencies may also request notification should a water use be disrupted.

Information provided in the PAP indicates the water rights applied for are a leased right and not an acquired right. Therefore, the operator would not be able to replace a right with these sources should diminution or quality of a water right be impacted through mining activities.

In the MRP, Section 3.4.3, the operator should remove the reference to discussions found in Section 7.1.6, regarding replacement of water rights, because there are no such discussions. The operator should cross reference Section 3.4.3, which describes the actions to be taken should loss of a water right use result from mining activities under Section 7.1.6 in order to provide a clear plan. The requirements under R645-301- 731.223 and 731.212 should be addressed. The operator should provide a plan which clarifies who will be notified should it be known that a water resource has been impacted by mining activities

Probable Hydrologic Consequences Determination

Impacts to the Perched Aquifer System

Small perched aquifers within or adjacent to the mine plan area may be impacted as a result of mining related subsidence (Section 7.3.2 - Determination, Impacts to the Perched Aquifer System). (6/2/2005)

Impacts to the "Regional" Aquifer System

(The term *regional aquifer* is commonly used to describe the saturated portions of the Blackhawk Formation and Star Point Sandstone - and sometimes other strata - in the Book Cliffs and Wasatch Plateau Coal Fields. However, ground-water storage and movement in these areas is typically of a local or intermediate nature and the Division feels there is little or no basis for generally describing these as regional systems.) (6/2/2005)

It is likely that ground water will be discharged from the mine, approximately 300 gpm during average operating periods and exceeding 500 gpm for short periods of time after mining intercepts water-bearing faults (7.3.2 - PHC Determination, Impacts to the Regional Aquifer System). (6/2/2005)

Approximately 25 gpm (41 acre-feet per year) of ground water will be removed with the mined coal based on average moisture content of 7.99 percent in the coal and maximum production of 700,000 tons per year. Dust suppression and similar uses will consume 6 gpm. Data in Appendix 7-9 indicate that the net loss of water by evaporation due to mine ventilation will be approximately 6 gpm (10 acre-feet per year), so the total consumptive loss to the hydrologic system will be 37 gpm (60 acre-feet per year) (7.3.2 - PHC Determination, Impacts to the Regional Aquifer System). (6/2/2005)

The influence of the water-bearing fault extends at least as far north as Beaver Creek, and may extend at least to the northern permit boundary. Mining will depress the aquifer to the maximum depth of the mined entries, and due to the large amount of water being transported by faulting, the potentiometric surface will be depressed in an area much larger than the permit area. The impact to the "regional" aquifer is expected to be temporary and the potentiometric surface will return to pre-mining conditions as soon as pumping ceases (7.3.2 - PHC Determination, Impacts to the Regional Aquifer System). (6/2/2005)

Impacts to the Hydrologic System Resulting From Subsidence

Projected limits of subsidence are shown on Plate 3-3. This map also shows the relationship of the planned mine workings and projected subsidence to the faulted zones bounding the graben. Mining-induced surface fracturing should be very limited (or nonexistent) within the Beaver Creek stream channel area. Appendix 7-13 contains a copy of the US Forest Service study of the impacts of subsidence caused by full-extraction mining beneath Burnout Canyon at the Skyline Mine. Based on the Burnout Canyon study, the Permittee has concluded that with 800 feet of cover or more, with panels oriented perpendicular to the stream, and with

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full extraction of the coal, some short-term effects can occur to the streams but the stream should revert to pre-mining configuration after three years (7.3.2 - PHC Determination, Impacts to the Hydrologic System Resulting From Subsidence). (6/2/2005)

The Permittee anticipates that subsidence will not significantly affect springs within the permit and adjacent areas, and that, because second mining will occur uniformly across the permit area, the resulting subsidence should also be uniform, minimizing the potential impacts to overlying springs (7.3.2 - PHC Determination, Impacts to the Hydrologic System Resulting From Subsidence). (6/2/2005)

Mining in the area adjacent to the Horizon permit area has not resulted in hydrologic impacts due to subsidence. Without extensive aquifer systems in units that overlie the coal in and adjacent to the permit area, it is anticipated that subsidence should not cause significant surface- or ground-water impacts within the permit or adjacent areas (7.3.2 - PHC Determination, Impacts to the Hydrologic System Resulting From Subsidence). (6/2/2005)

Acid- and Toxic-Forming Material

Operational Monitoring and Identification of Acid- and Toxic-Forming Materials

The operator has not provided a specific discussion for the potential for acid and toxic forming materials under the Probable Hydrologic impacts. However, the operator provided the following in other sections of the plan:

- Disposal of waste rock from partings and splits will be in underground workings. No acid or toxic forming materials are present in the overburden or underburden for samples analyzed (Section 6.5.7.1), suggesting no acid or toxic forming materials will be in the partings. The waste rock will be backfilled and compacted after second mining subsidence occurs and the waste rock will not be saturated, thus, water quality would not be impacted (Section 3.3).
- If underground waste cannot be blended, sold, or gobbled, arrangements will be made to dispose of this material in permitted refuse piles at a nearby mine.
- Noncoal waste rock from initial development will be incorporated as fill in the mine yard (Section 3.3).

Table 6-5 summarizes the quality of the Hiawatha Coal seam. The acid base potential of each of the three coal samples collected from the HZ-series holes indicate the coal has a potential to be acid-forming (Section 6.5.6). Coal will be stored on the surface for short periods and run off from the coal stockpile will be routed through the sedimentation pond where it will mix with run off water that is more alkaline.

Tests for acid and toxic forming materials were conducted on roof and floor samples in LMC-4 and HZ drill holes. One sample contained a high pyritic sulfur content of 0.24 percent. The operator suggests this pyritic sulfur content is likely of limited areal extent. This information conflicts with the statement in Section 6.5.7.1.

In Section 6.5.6, the operator has presented analysis from a core sample of the coal obtained from the Hiawatha Seam, drill hole LMC-4. The presented analyses has a sulfur content of 0.47% of which 0.04% is pyrite sulfur with marcasite, 0.038% pyrite and 0.002% is marcasite.

All of the coal will not be removed from underground. Much of this coal will be in contact with air and water during the mining operations and may cause a lowering in the pH of those waters. Currently water from the old Blue Blaze No.1 Mine workings are shown to have a pH of 6.8 to 7.66. In general, these are lower than the surrounding area pH values.

Acid forming discharges have been uncommon and are generally not regionally extensive. Should the presence of pyrite in the mine area cause a decreased pH locally the mixing with higher pH waters in the system would result in localized affects due to downstream buffering.

Where material is trucked to permitted refuse piles at a nearby mine, the acid and toxic characteristic of this material should be known at the permitted mine receiving the waste.

Potential Ground-water Impacts

The operator indicates inter basin transfer out of the Price River drainage cannot occur in this region. However, inter basin transfer between Beaver Creek and Gordon Creek could occur. Because the coal seams dip away from the portal entrance, flow is likely to be sumped underground and could be directed toward the fault systems to the northwest, however, the Operators information indicates the Piezometric surface for the Star Point aquifer is to the east southeast. Flow will occur in the direction influenced by the prevailing geologic controls which are not definitively known at this time.

The control of faulting on ground-water flow can be seen by comparing the potentiometric surface map to the geologic structure. The operator indicates that due to low permeability, and due to the plan to avoid mining into faulted zones, in flow to the mine from faulted zones is projected to be minimal (Section 7.1.2.2). Discussions on how the faults will be avoided were not presented.

The operator has concluded that the Hiawatha coal seam will be saturated from the beginning of mining operations. The rate of inflow will depend primarily on whether a faulted

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zone is encountered that contains ground water in storage or that is in connection with an overlying perched aquifer. Although the possibility of a significant sustained inflow occurring is probably low to moderate, the actual potential impact from intercepting a fracture reservoir and depleting or intercepting the flow is moderate to high. A resulting loss of head could disrupt stream and spring flows and possibly recharge the fracture zone down dip to the north east or in the direction of regional flow to the east-southeast. Changes in quantity and quality to spring and surface water discharges associated with the faults could be the result.

Waste rock from the mining procedure is proposed to be gobbled underground and backfilled. Because the materials will have an increased surface area due to removal the potential impacts, should water and air come in contact with the materials, would be increased TDS (ions in solution) and potential acid and toxic formation. Data from a recent underground mine water sample from the No. 1 Mine is found in Chapter 7 and may be indicative of some potential water quality changes. See the section above on **Acid and Toxic Forming Materials** in this TA.

Section 3.3.1, Plate 3-3, does not show all known and existing mine workings in the permit and adjacent area. These areas are critical to supporting documentation regarding the Probable Hydrologic Consequences of mining as it might relate to other mines vs. the proposed Horizon Mine. The operator must include this information in the plan for all seams and mining in the permit adjacent area.

The operator states, "It is not anticipated that large quantities of ground water will be encountered throughout the duration of mining". The Division believes the potential for impact increases if water is intercepted by mining through paleochannels associated with fractures, or a water-bearing fault or fracture system is intercepted by mining activities. The potential for impact appears to be highest if fracture associated flows in the Hiawatha Seam are intercepted as occurred in the Beaver Creek Coal Mine.

The operator has estimated the "worst case" potential inflow through a porous formation (exclusive of fracture flows) to be 2.6×10^{-4} and to have an average potential inflow of 1.5×10^{-4} , or a flow rate of 9 and 5 gpm per section. Assuming six sections the total potential inflow would vary between 30 and 54 gpm. This information assumes a worst-case scenario between 270 to 130 feet of head. Therefore, the potential is that a decrease of head in the Star Point Sandstone of between 270 and 130 feet could occur over time. The extent to which this affects the adjacent area is limited to the interaction of the members along the fault zones and determination of discharge areas. The aquifer may be dewatered within the graben with out interaction with the fracture/fault related waters or, may affect the waters associated with the fault system.

Potential Surface Water Impacts

On page 7-22, the operator states that proposed mining operations will occur north of Gordon Creek and should not affect the quantity or quality of water in this drainage. However, it

was noted that approximately 400 gpm inflow was produced from the floor when mining the Hiawatha Seam. This information, along with the dewatering estimates discussed above under the *Potential Ground-water Impacts* of this T.A., indicate there may be a potential to intercept ground-water flow from below the Star Point Sandstone, below the Hiawatha Seam. This flow interception could impact base flow to Gordon Creek, or relocate the source of the flow. Supporting information can be determined by assuming the control point for the piezometric surface would likely be at the elevation related to the dip. With a dip of 5.3% to the northwest an outcrop elevation of approximately 7,600 and a maximum linear distance down dip of 5,000 feet the zone of influence most likely to be impacted below the Hiawatha Seam would be from approximately 7,600 ft to 7,335 ft. This is also within the range of the piezometric surface of 7,500 and is in the general direction of the assumed ground-water flow. Water quantity, water quality, and losing and gaining sections for reach segments should be determined for Gordon Creek above and below this section. A continuous recording flume is recommended for operational monitoring if the characteristic of the stream is determined to be potentially impacted.

The operator indicates the water associated with the Beaver Creek Coal Company No. 3 Mine is believed to be in communication with Beaver Creek and will be avoided when mining the proposed Horizon No. 1 Mine. Avoidance will occur by closely monitoring the activities in the fault area. The operator has not demonstrated why they believe the communication with Beaver Creek exists and has not provided a monitoring plan, which addresses this potential impact.

Subsidence Control and Renewable Resource Protection

The Stream Buffer Zones will be maintained beneath Beaver Creek and the North Fork of Gordon Creek should mining proceed beneath either creek (Section 3.3.2.2).

The proposed stream channel buffer zone is shown on Plates 3-3. Retreat mining will not occur under those areas shown to be within the buffer zone. A discussion on the width of the buffer zone was not found. The operator has stated that mining is designed to preclude subsidence of perennial and intermittent stream reaches. Specifics to the statements regarding these buffer zone areas could not be located. However, comments made by the operator suggest that massive sandstone units make it unlikely that subsidence will reach the surface, and swelling shales in the overburden would have a tendency to heal fractures.

According to the Operators subsidence plan a measurable subsidence effect would include a marked decrease in flow of 30%. In order to determine whether a marked decrease in flow occurred frequent monitoring would be required. The operator should describe how the monitoring plan monitors for this potential impact.

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The operator suggests the following reasons indicate potential for damage due to subsidence will be low because no noticeable mining subsidence has occurred in the Gordon Creek #2 area (mined over 40 years ago) and in the Consumers No. 3 Mine, Section 3.2.3. The following areas were previously mined beneath Beaver Creek

- Swisher Coal Company mined under Beaver Creek in the northern most west panel of the Castlegate "A" seam in January 1978. Overburden is approximately 650 ft.
- Beaver Creek Coal Company mined under Beaver Creek in the "A" panel in September 1981. Overburden was approximately 425 feet.

Although longwall mining subsidence occurs immediately following mining, room and pillar subsidence may not occur for a long period of time. The proposal to monitor subsidence annually for two years following cessation of mining is probably adequate for determining immediate subsidence response. However, prior to bond release the lack of, or presence of, subsidence should be confirmed.

Statements in the PAP indicate that if significant inflow of ground water occurs mitigation measures may include; attempts to seal the inflow, increased monitoring program, lining the stream bed through an effected area, and replacement of water, should it be indicated through monitoring to be mining related (Section 3.4.8.2). In Section 3.4.8.4, the operator commits to notify the Division in writing and begin implementation of the approved mitigation plan if adverse impacts to Beaver Creek are noted as a result of mining. The operator will be encouraged to complete short-term mitigation measures such as sealing the flow from in the mine. However, Division notification should occur as soon as possible and coordination with concerned parties may be necessary prior to approval of a site-specific mitigation plan.

Water Use

"Water will be pumped from the North Fork of Gordon Creek into the mine for use in dust abatement". Based on the predicted inflow information the operator has estimated approximately 31 acre feet per year will need to be pumped into the mine, while it is estimated that 41 acre feet will be removed with the coal each year. The water rights applied for by the operator exceed the predicted water needs.

Sediment Yield

The potential for increased suspended solids and sediment loading to Gordon Creek is probably highest during the construction phase of operation and reclamation. The operator has committed to monitor for turbidity of the water upstream and downstream of the site during the construction phases. A criteria for Class 3C allows a turbidity increase of 15 (NTU).

Increases in sediment during the operational period will be minimized through the use of a sedimentation pond and drainage controls. The operator has also committed to store snow in sites that will directly drain to the sedimentation pond (Section 3.3). During the reclamation period it is not clear whether alternate sediment control measures or sedimentation pond measures will be used.

During the past four years logging activities have taken place in the Beaver Creek area on Stamatakis property. Logging and transport activities have disturbed substantial areas along the roads and riparian areas of Beaver Creek, the North Fork of Gordon Creek and Jewkes Creek. Trees are removed from the property and transported out over the county road which connects to State road 139, the North Fork of Gordon Creek. There have been no Best Management Practices for logging conducted on this logging site. Sediment yield from the logging sites and roads has been substantial. During the summer of 1997 the team conducting a subsidence noticed areas logged down to the Beaver Creek without a protection barrier. Sediments from the logging sites and access road flowed directly into the creek. Trees and branches littered the side of the creek. The dirt road along Beaver Creek was ground to a fine powder, in some places as much as 1 foot deep. The point bars and bottom of Beaver were covered with silt.

Logging continued during the winter months. As roads became muddy the logging company used a graders and bulldozers to excavate the muddy layers which were pushed in mounds above the roads and creeks, where they could easily flush into the creeks (Beaver Creek, a tributary to the North Fork of Gordon Creek and Jewkes Creek. Sediment loading into the creeks will likely continue until logging is completed. Operational monitoring could show significant changes in water quality and aquatic wildlife levels as a result of the logging practices.

Surface Water Quality

Currently coal mining waste may exist near Test Pit No. 8. This waste (potentially 9,718 cubic yards) is proposed to be stockpiled adjacent to the coal stockpile and blended (Section 3.3.2.7). The operator has stated that if acid and toxic materials remain on site they will be buried by 4 feet of cover. Currently water moves through the fill and seeps toward Jewkes Creek. The water quality of this site is likely to be improved with the proposed reclamation measures.

The operator should provide a discussion on potential changes in water quality based on data obtained from the Blue Blaze in mine waters. Based on impacts from other mining operations the potential for increased TDS is likely in the permit area. The operator sites downstream increases in TDS when flowing over Mancos as a factor in considering impact as minimal. Because downstream waters are naturally degraded the use and quality of the upstream waters retains its importance. However, impacts to downstream waters would probably not be notable.

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The road to the mine is maintained as a gravel road therefore the use of road salting is not likely to affect water quality.

Hydrocarbons

Loadstar Energy Inc. indicates Diesel fuel, oils, greases, and hydrocarbon products will be stored above-ground and may be spilled in the mine and on the surface during mining operations. An above ground 5,000-gallon diesel fuel tank will be located between the coal stockpile and the truck turn around as indicated on Plate 3-1 (review plate for proximity to surface water). A shop maintenance area will be located next to the mine office area.

The operator proposes the berm surrounding the tank will be adequate to contain the total volume of the tank, in the event water needs to be drained from the berm. The operator indicates spills will be handled in accordance with the Spill Prevention Control and Countermeasure (SPCC) Plan. This plan is provided in draft form without a certified signature in the PAP under Appendix 7-8. Elements of the plan include:

- Visual inspection of all tanks, associated valves piping and containment areas.
- Notification to the Mine Manager and containment of the spill
- Reporting requirements for spills.
- Procedures for preventing spills during filling tanks.
- A copy will be maintained on file in the Mine Manager's Office and the Mine Engineer's office.

The Operator's proposal uses accepted practices for their SPCC plan. The operator should include clean up procedures for small scale spills, commit to retain absorbent materials on site and, should provide either a concrete containment structure with a drain or provide for disposal and sampling of the earth material below the fuel tanks and areas of hydrocarbon use.

The operator can provide additional reasonable operation measures to minimize hydrologic impacts on and off the permit area.

In addition to the discussion on containment of spills, the Permittee has added a statement that there is no intention of abandoning equipment underground. Should it be necessary to abandon any equipment underground, the Permittee commits to drain all petroleum products from the equipment, and show locations of abandoned equipment on a mine map that will be submitted to the Division (7.3.2 - PHC Determination, Potential Hydrocarbon Contamination). (6/2/2005)

Flooding or Streamflow Alteration.

All disturbed-area runoff will flow through the sedimentation pond or other sediment-control device. The sedimentation pond is designed to contain the 10-year, 24-hour storm event (Section 7.2.3.2 - Sedimentation Control Structures and Diversions, Disturbed Area Runoff and Sediment Control). (6/2/2005)

The operator discusses the potential for flooding as being diminished due to the sedimentation pond reducing peak flows. In addition to the Operators comments, it is likely that the water flowing through the culvert will have increased flow velocity over the natural velocities for the same discharge rates. A potential impact includes downstream erosion. The operator has provided riprap channel designs for the velocities than may occur from a 100-year, 6-hour event, which meets the minimum regulatory requirements. Other potentials for streamflow alteration are discussed under Potential Surface-Water Impacts and Potential Ground-water Impacts.

Sediment-control devices are designed to be stable, minimizing the potential for breaches that could cause downstream flooding; sediment is retained on-site, so bottom elevations of stream channels downstream from the disturbed areas are not artificially raised and the hydraulic capacity of the stream channels is not altered; and flow routing through the sediment control devices reduces peak flows from the disturbed areas, precluding flooding impacts to downstream areas. Following reclamation, stream channels will be returned to a stable state, minimizing detrimental effects that may result from flooding (7.3.2 - PHC Determination, Flooding Potential of Downstream Areas). (6/2/2005)

The addition of the discharged mine water is not expected to alter the natural channel and the potential for stream channel alteration is minimal. Maximum discharge is expected to occur only for short periods of time, when water-bearing faults are intercepted. Even the maximum discharge from the mine during the 100-year 6-hour storm event would not cause Jewkes Creek below the mine facilities to exceed its channel capacity (7.3.2 - PHC Determination, Flooding Potential of Downstream Areas). (6/2/2005)

Projected limits of subsidence are shown on Plate 3-3, which also shows the relationship of the planned mine workings and projected subsidence to the faulted zones bounding the graben. If subsidence does occur, the Permittee expects it to be uniform with little to no impact on Beaver Creek or other drainages in the area. The Permittee commits that if sharp drops occur at the faults at the edges of the graben that bounds the mine workings, the impacted sections will be reconstructed to prevent erosion and loss of topsoil. To stop flow being lost into the fault, the channel area would be excavated and backfilled with clay prior to reconstructing the channel. If subsidence fractures occur in Beaver Creek without vertical displacement but flow is lost into the fracture, a mixture of soil and bentonite will be used to seal the fracture. In the event that stream channel mitigation is required, the Permittee commits to submitting designs to the Division for approval prior to commencing any construction activities (7.3.2 - PHC Determination, Flooding Potential of Downstream Areas). (6/2/2005)

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Groundwater Monitoring Plan

Seeps and springs in the permit and adjacent areas are shown on Plate 7-1. (6/2/2005)

The mine operators conducted surveys for watercourses, seeps, and springs in the federal lease and surrounding areas. Areas evaluated included Sand Gulch, Coal Canyon, and several unnamed drainages that contribute to Jump Creek. Flow and temperature for each seep or spring are summarized in Appendix 7-2 (Section 7.1.1 - Method of Study). (6/2/2005)

Water levels in the piezometers have been measured quarterly and results are tabulated in Table 7-of the MRP and in the Division's database. (6/2/2005)

Surface-Water Monitoring Plan

Surface water resources and locations from which samples have been collected in the permit and adjacent areas are shown on Plate 7-1. Baseline hydrology was based on review of literature and available data obtained from the USGS, the US Forest Service, the State of Utah, Beaver Creek Coal Company, Blue Blaze Coal Company, and mine permit applications for the surrounding mines. Field reconnaissance was performed to confirm the location and characteristics of surface watercourses, springs, and seeps (Section 7.2.1 - Methodology). (6/2/2005)

Findings:

The operator has submitted sufficient information to address this section.

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.24, 783.25; R645-301-323, -301-411, -301-521, -301-622, -301-722, -301-731.

Analysis:

Affected Area Boundary Maps

The affected area, as defined by R645-100-200, includes both the area of actual surface disturbance and the area above the underground mine workings, which might be affected by subsidence resulting from the underground mining operation.

The affected area boundary not only contains the permit boundary but additional subareas where additional permit would be sought. The Permittee did not indicate that they planned to seek additional acreage. On Plate 3-3, the Permittee shows that most of the surrounding area is faulted making a simple expansion unlikely. Therefore, the Division considers the affected area

boundary map to be the same as the permit area boundary map. See Plate 1-1, Permit Boundary. (6/2/2005)

The boundary of the disturbed area of the Horizon Coal operation, which includes proposed as well as previous disturbance, is shown on Plate 3-1--Surface Facilities. The boundaries of all areas that are to be newly disturbed by this operation are also shown on Plate 3-6--Premining Topography and Plate 3-7--Post Mining Topography.

Archeological Site Maps

No archeological sites have been identified on Federal Lease UTU-74804 .

Coal Resource and Geologic Information Maps

Figure 6-2 in the text section identifies the general regional geology. There are no coordinates or boundary lines to provide specific reference on the map, however it does give an idea of the relationship between surface stratigraphy and faulted areas. Plate 6-1 provides more detail of the geology and permit area. The map shows a layout for the geologic cross sections, shown in Plate 6-2 (N-S cross section) and 6-3 (E-W cross section). The streams are not shown on Plate 6-1. Figure 6-3 provides information of the regional structure. Generally the structure is to the north-northeast; however, due to the multitude of fault in the area the slope could change in any fault block. (6/2/2005)

Overburden isopach thickness and coal seam thickness are shown on Plate 3-3. Projected limits of subsidence are shown on Plate 3-3, which also shows the relationship of the planned mine workings and projected subsidence to the faulted zones bounding the graben. (6/2/2005)

Additional information on lithologic characteristics for the permit and adjacent areas is shown on geologic cross sections on Plates 6-2 and 6-3. Approximate locations of the boreholes and measured sections used to make these cross sections are shown on small index maps and tabulated in Tables 6-3 and 6-4. [06/02/2005]

Cultural Resource Maps

An evaluation of cultural resources has been conducted and a negative findings is presented in Appendix 5-1 of the MRP. [06/02/2005]

Existing Structures and Facilities Maps

No new structures will be developed above Federal Lease UTU-74804. All surface facilities and structures are described in the MRP.

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The term existing structures and facilities is defined as:

“A structure or facility used in connection with or to facilitate coal mining and reclamation operations for which construction began prior to January 21, 1981.”

The Permittee does not propose to use any existing structures or facilities in connection with the permit boundary expansion. (6/2/2005)

Existing Surface Configuration Maps

Pre-mining, operational and reclamation surface configuration maps are located in the MRP.

Mine Workings Maps

Old mine workings are shown on Plates 3-9 and 3-10. Projected mine workings are on Plate 3-3. There has been no surface mining within the permit and adjacent areas. [06/02/2005]

Monitoring and Sampling Location Maps

The permit application package identifies that the location of all known seeps and springs, as well as watering ponds or tanks are shown on Plate 7-1. There are no lakes or ponds or irrigation ditches known to exist within the proposed permit or adjacent areas. The locations of bore holes are shown on Plate 6-1-Geology and Plate 7-1-Water Monitoring Locations. [06/02/2005]

Permit Area Boundary Maps

The permittee shows the new and old permit boundaries on Plate 1-1. That plate was certified by a registered professional engineer. Plate 1-1 shows the following:

- The old and new permit boundaries
- The disturbed area boundary
- Township, range and sections
- Topography (80-foot contours)
- Roads and stream. [06/02/2005]

Subsurface Water Resource Maps

Surface and Subsurface Manmade Features Maps

Surface and Subsurface Ownership Maps

The topography of the proposed disturbed area is shown by contours on Plate 3-6--Premining Topography and by profiles on Plate 3-2--Premining and Operational Cross Sections. Plate 3-6 also shows the extent and nature of existing disturbance and all existing manmade structures.

Representatives of the Division visited this site several times in 1991 and 1992, in connection with the Division's review of the original Blue Blaze proposal, in order to observe the site and check the accuracy and completeness of the maps, which are identical to the maps found in the present plan. The Division found that the maps cited in this section--Plate 3-6--Premining Topography and Plate 3-2--Premining and Operational Cross Sections--accurately show the existing surface configuration of the proposed disturbed area, as defined in this section, and thus fulfill the requirements of this section.

Surface Water Resource Maps

The aquifers associated with the Castlegate "A" and Hiawatha Seams were determined to be discontinuous over the area to be mined and therefore have not been mapped.

Potentiometric surface maps on Figures 7-2, 7-2A, and 7-2B show seasonal and longer-term variations in the potentiometric surface for water in the Star Point Sandstone. (6/2/2005)

Surface and Subsurface Manmade Features Maps

All surface and subsurface manmade features within and adjacent to the permit area are shown on Plate 3-1- Surface Facilities and Plate 1-1- Permit Boundary. There are no major electric transmission lines, pipelines, agricultural drainage tile fields, or occupied buildings in or within 1,000 feet of the permit area.

Land Use is shown on Plate 4-1. Present owners of record of surface lands are shown on Plate 4-2, and Coal Ownership is shown on Plate 4-3. [06/02/2005]

Vegetation Reference Area Maps

Well Maps

Plate 6-1 identifies the wells and drill holes on and adjacent to the permit area. There are no gas or oil wells within, and no water wells within or adjacent to, the proposed permit area, as shown by Plate 3-1--Surface Facilities and Plate 1-1--Permit Boundary. These maps, as stated

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above, show all surface and subsurface manmade features within and adjacent to the permit area. Three water-monitoring wells were drilled in the area, IPA #1, IPA #2 and IPA #3, to monitor mine water levels. These wells are shown on Plate 7-1. (6/2/2005)

Findings:

The Permittee has submitted sufficient Maps, Plans and Cross Section information to meet the minimum requirements of the regulations. (6/2/2005)

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MINING OPERATIONS AND FACILITIES

Regulatory Reference: 30 CFR 784.2, 784.11; R645-301-231, -301-526, -301-528.

Type and Method of Mining Operations

Analysis:

The permittee proposes to do all mining with room-and-pillar mining methods. First mining only will be done to protect all entries, mains and no subsidence areas. Second mining will be done to maximize coal recovery when possible. [06/02/2005]

Findings:

The requirements of this section of the regulations are considered adequate in regard to the proposed permit changes for the addition of the permit boundary to include part of the federal coal lease UTU-74804.

EXISTING STRUCTURES:

Regulatory Reference: 30 CFR 784.12; R645-301-526.

Analysis:

Existing structure means a structure or facility used in connection with or to facilitate coal mining and reclamation operations for which construction began prior to January 21, 1981. There are no existing structures involved with the permit boundary expansion. (6/2/2005)

Findings:

Sufficient information has been submitted to address this section.

PROTECTION OF PUBLIC PARKS AND HISTORIC PLACES

Regulatory Reference: 30 CFR 784.17; R645-301-411.

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Analysis:

No public parks or historic places will be impacted as a result of adding Federal Lease UTU-74804 to the permit area.

Findings:

The Permittee has submitted information in the previous permit application to address this section.

RELOCATION OR USE OF PUBLIC ROADS

Regulatory Reference: 30 CFR 784.18; R645-301-521, -301-526.

Analysis:

No new roads will be developed or relocated in relation to developing Federal Lease UTU-74804

Findings:

Sufficient material has been submitted to make a determination on this matter.

AIR POLLUTION CONTROL PLAN

Regulatory Reference: 30 CFR 784.26, 817.95; R645-301-244, -301-420.

Analysis:

Chapter 3 Section 3.4.7 of the current operation and reclamation provides for the protection of air quality. Because there is no surface disturbance associated with Federal Lease UTU-74804, the current air pollution control plan is adequate. [06/02/2005]

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

COAL RECOVERY

Regulatory Reference: 30 CFR 817.59; R645-301-522.

Analysis:

Because the permittee proposed to add a federal coal lease to the permit area they must get approval for the coal recovery plan from the BLM. The BLM has approved the R2P2 (resource recovery and protection plan) for the additional lease area. The Division relies on the findings in the R2P2 when evaluating the coal recovery plan. The permittee requirements of this section have been addressed within the approved mining and reclamation plan, Chapter 5. (6/2/2005)

Findings:

The Permittee has submitted sufficient Coal Recovery information to meet the minimum requirements if the regulations. (6/2/2005)

SUBSIDENCE CONTROL PLAN

Regulatory Reference: 30 CFR 784.20, 817.121, 817.122; R645-301-521, -301-525, -301-724.

Analysis:

Renewable Resources Survey

Hydrologic and vegetative renewable resources are the in the permit boundary. Seeps and springs also exist in the permit area. Beaver Creek is the only perennial stream near the permit area. [06/02/2005]

Subsidence Control Plan

The subsidence control plan must contain the following:

- *A description of the method of coal removal, including the size, sequence, and timing for the development of underground workings.* The Permittee commits to conduct all mining operations using room-and-pillar methods. When possible the Permittee will extract pillars as part of retreat mining. The size, sequence and timing for the Horizon Mine were shown on Plate 3-3. (6/2/2005)

A map of underground workings which describes the location and extent of areas in which planned-subsidence mining methods will be used and which included all areas where measures would be taken to prevent or minimize subsidence and subsidence related damage and where appropriate, to correct subsidence-related material damage. The Permittee shows the subsidence area on Plate 3-3. The Permittee shows the subsidence zone based on two different angels of draw. The first angle was 35-degree and the second was 22.5 degree. Dunrud considered it the maximum angle of draw in the U.S. The 22.5-degree angle of draw is based on subsidence studies from local mines. (6/2/2005)

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The only subsidence protection addressed in the amendment was for Beaver Creek. The Permittee stated they will protect Beaver Creek by orienting the panels perpendicular to the stream and use full extraction mining. This layout is similar to that of Burnout Canyon at the Skyline Mine. Results from the Burnout Creek study suggest that subsidence will not have a significant impact on Beaver Creek. (6/2/2005)

The Permittee shows in Section 3.4.8.4 the equations that they used to calculate that the maximum subsidence amount would be 2.3 feet. Also see Figure 3-5. (6/2/2005)

The Permittee will not take specific actions to prevent subsidence damage to roads. The roads in the area are dirt. Should subsidence damage the roads the Permittee commits to repair the roads. (6/2/2005)

- *A description of the physical conditions, such as depth of cover, seam thickness, and lithology, which affect the likelihood or extent of subsidence and subsidence-related damage.* The Division addressed those requirements in the geology sections of the TA. (6/2/2005)
- *A description of monitoring, if any, needed to determine the commencement and degree of subsidence so that, when appropriate, other measures can be taken to prevent, reduce, or correct material damage.* The Permittee describes the monitoring program in Section 3.4.8.5 of the MRP. The plan called for placing survey monuments inside and outside the subsidence zone. The Permittee committed to take readings at each station once a year until two years after cessation of mining operations. (6/2/2005)

The survey monuments and monitoring points are shown on Plate 3-3. The Permittee committed to: 1) install enough station so that at least one station will be subsided every year, 2) establish a draw line on panels 2nd Right 1st North, 3rd Right 1st North or 4th Right 1st North (the information from the subsided draw line will be used to establish a local angle of draw) and 3) conduct a land survey over each panel no sooner than six months after the panel was mined out but no more than 1 year especially in critical areas such as areas of maximum tension and compression. (6/2/2005)

The Permittee also included monitoring points for Beaver Creek and the seeps and springs in the area. Those monitoring points are needed to determine if subsidence caused damage to water rights. (6/2/2005)

- *A description of monitoring, if any, needed to determine the commencement and degree of subsidence so that, when appropriate, other measures can be taken to prevent, reduce, or correct material damage.* The Permittee does not propose any additional monitoring methods. (6/2/2005)
- *Except for those areas where planned subsidence is projected to be used, a detailed description of the subsidence control measures that will be taken to prevent or minimize subsidence and subsidence-related damage, including, but not limited to: backstowing or backfilling of voids; leaving support pillars of coal; leaving areas in which no coal is removed, including a description of the overlying area to be protected by leaving the coal in place; and taking*

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measures on the surface to prevent material damage or lessening of the value or reasonably foreseeable use of the surface. The Permittee shows the areas where subsidence would occur on Plate 3-3. (6/2/2005)

- *A description of the anticipated effects of planned subsidence, if any.* The Permittee states in Section 3.2 that they do not anticipate any damage to Beaver Creek because of subsidence. (6/2/2005)
- *A description of the measures to be taken to mitigate or remedy any subsidence-related material damage to, or diminution in value or reasonably foreseeable use of the land, or structures or facilities to the extent required under State law.* (6/2/2005)

In Section 3.4.8.2 of the MRP, the Permittee addressed two types of subsidence mitigation. For surface cracks and depressions, they committed to filling in fractures. For damage to larger areas the Permittee committed to grade and planting the areas and intensify monitoring. (6/2/2005)

In Section 3.4.8.2, Renewable Resources, the Permittee states that water replacement was addressed in Section 7.1.6. In that section the Permittee committed to replace State appropriated water rights as follows:

Specific methods to promptly replace a water supply impacted by mining operations would include (but not limited to): repair or replacing a pond damaged by mining operations, hauling water by truck to replace water impacted by mining operations, drilling a new water well or transfer of water rights to the damaged party. (6/2/2005)

The Permittee's water-replacement commitments address elements of both R645-301-731.530 and R645-301-525.480, but the Permittee's commitments to replace water supplies and the methods described to carry out such replacement are sufficient to meet the requirements of the Coal Mining Rules. (6/2/2005)

The Permittee talks about ground-water loses that could occur if water entered the mine. The remediation methods include sealing underground cracks, lining the streambed and additional monitoring. The Permittee also commits to replace water after mining is completed. (6/2/2005)

Other information specified by the Division as necessary to demonstrate that the operation will be conducted in accordance with the performance standards for subsidence control. The Permittee commits to remediation for subsidence damage any the roads. (6/2/2005 WHW)

Performance Standards For Subsidence Control

The Permittee must maintain the subsidence performance standards. (6/2/2005)

Notification

In the amendment, the Permittee removed the commitment to notify property owners six months prior to undermining their property. R645-301- 525.700 requires the permittee to notify at least six months prior to mining the water conservancy district, if any, in which the mine is located and to all owners and occupants of surface property and structures above the underground workings. The notification will include, at a minimum, identification of specific areas in which mining will take place, dates that specific areas will be undermined, and the location or locations where the operator's subsidence control plan may be examined. The Permittee does not have to have that commitment in the MRP. However, they are required to observe that regulation. (6/2/2005)

Findings:

Information provided in the proposed amendment is considered adequate to meet the requirements of this section.

SLIDES AND OTHER DAMAGE

Regulatory Reference: 30 CFR Sec. 817.99; R645-301-515.

Analysis:

Federal Lease UTU-74804 extends the underground operations. There is no change to the approved reclamation plans.

Findings:

The Permittee has submitted sufficient information to address this section.

FISH AND WILDLIFE INFORMATION

Regulatory Reference: 30 CFR Sec. 784.21, 817.97; R645-301-322, -301-333, -301-342, -301-358.

Analysis:

Protection and Enhancement Plan

A description of the wildlife mitigation and management plan is located in Section 10.5 of the current operation and reclamation plan. Potential impacts from mining would be best characterized as habitat loss. Because there will be no surface disturbance the only potential impact would be habitat loss resulting from subsidence. The 2000 raptor survey provided by the Permittee shows the existence of one active Kestrel nest, one inactive Golden Eagle nest and one Golden Eagle old/dilapidated nest. Plate 10-1 also identifies two unoccupied Golden Eagle nests. The Permittee has proposed to verify the

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status of the identified raptor nests prior to full pillar extraction being completed within 500' of an active nest. Should a nest be active, mining practices will provide for a 200' barrier around the nest location. A 100' barrier will be provided around inactive nest locations. Nests lost or damaged due to subsidence or other mine related causes will be replaced under the guidelines and assistance from The Division of Wildlife Resources. The current plan, (Chapter 10, plate 10-1), identifies the proposed lease area as critical summer habitat for deer and elk. The 2001 raptor survey included in the application does not show the existence of any raptor nests in the proposed lease area. However the portion of Beaver Creek and associated riparian areas that extends through the proposed lease area from Southwest to Northeast would be considered high value and or crucial habitats as well as any springs in the area. The application indicates that these areas will be mined under and uniformly subsided. Hidden Splendor Resources has committed to developing a protection and enhancement plan in conjunction with the Division of Wildlife Resources and the Division of Oil Gas and Mining prior to any secondary or retreat mining under Beaver Creek, page 10-40. The Protection and Enhancement plan for these habitat areas that may be impacted by subsidence should include the following criteria for inclusion in the plan:

- A monitoring schedule for the macroinvertebrates in Beaver Creek,
 - Color infrared aerial photo monitoring of the riparian and meadow areas associated with Beaver Creek once every three years,
 - Channel characteristics, Cross Sections, Longitudinal profiles, and
 - Riparian Surveys as described in the Skyline Mine Subsidence Study. The plan should be developed in cooperation with the Division of Wildlife Resources and the Division of Oil, Gas and Mining.
- (6/2/2005)

Endangered and Threatened Species

The list of threatened, endangered and candidate species that may occur within the proposed lease area are the Bald Eagle, Black-Footed Ferret, Bonytail Chub, Colorado Pike Minnow, Humpback Chub, and Razorback Sucker. They are listed in table 10-1 of Chapter 10 of the current operation and reclamation plan. The text on page 10-25 and table 10-1 has been updated to reflect the current status of Threatened, Endangered and Candidate species. Most threatened or endangered species that could occur in Carbon County occur at lower elevations than the mine and have no habitat in the proposed permit area expansion. There have been no confirmed sightings of Black-Footed Ferrets in Carbon County in several years. However, the mine has potential, through water depletions, of adversely affecting four listed threatened and endangered fish species of the upper Colorado River drainage. The Fish and Wildlife Service requires mitigation when water depletions exceed 100 acre-feet annually. Chapter 7, Section 7.3.2 (PHC Determination), provides for the criteria and volumes used to calculate an estimate of 60 acre-feet of water per year. (6/2/2005)

Bald and Golden Eagles

Bald eagles are common in the area during the winter and could occasionally fly through or roost in the proposed addition to the permit area. Mining would have negligible effects on these birds.

Wetlands and Habitats of Unusually High Value for Fish and Wildlife

Beaver Creek and several springs and ponds are adjacent to or lie within the proposed permit area revision. The Permittee is currently monitoring Beaver Creek and certain springs, and wells in the proposed addition to the permit area (plate 7-1). The Permittee has proposed to maintain a 100' Buffer zone along Beaver Creek to prevent impacts to the stream. Subsidence monitoring points are identified on plate 3-3. The portion of Beaver Creek and associated riparian areas that extend through the proposed lease area from Southwest to Northeast would be considered high value and or crucial habitats as well as any springs in the area. The application indicates that these areas will be mined under and may be subsided. Therefore the application needs to include a Protection and Enhancement plan for these habitat areas in the event they are impacted by subsidence. Suggested criteria are noted in the Protection and Enhancement Plan section of this document. (6/2/2005)

Findings:

The information contained in this section of the application is adequate to meet the requirements of the regulations.

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-230.

Analysis:

Plate 3-1 shows the planned surface facilities. Section 3.5.2 states that during any future disturbance, topsoil will be stockpiled, contoured, fertilized and vegetated with seed mix #1 (Table 3-2). The piles will be protected with markers and berms or strawbales. And (Section 3.4.4) that disturbed soils will be carefully handled for use as substitute topsoil materials.

Topsoil Removal and Storage

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

VEGETATION

Regulatory Reference: R645-301-330, -301-331, -301-332.

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Analysis:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: 30 CFR Sec. 784.24, 817.150, 817.151; R645-301-521, -301-527, -301-534, -301-732.

Analysis:

Road Classification System

Plans and Drawings

Performance Standards

Primary Road Certification

Other Transportation Facilities

Findings:

SPOIL AND WASTE MATERIALS

Regulatory Reference: 30 CFR Sec. 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

Analysis:

Disposal Of Noncoal Mine Wastes

Section 3.2.3 *Surface Facilities* indicates that there will be no disposal of non-coal waste on site other than rock type construction materials. And further that the disposal of rock-type construction

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materials will be disposed of in underground workings within the Horizon Mine, not on the surface. Garbage will be hauled to the state-approved landfill (Section 3.2.3.8).

Coal Mine Waste

Section 3.2.3.100 states that no coal mine waste disposal facilities will exist on the surface in the permit area. Section 3.2.600 indicates that coal mine waste will be handled as outlined in this section and previously in this MRP. Section 3.2.3 *Surface Facilities*. Indicates that underground development waste will be disposed of underground with the Horizon Mine. If waste is brought to the surface, a permanent stockpile will be permitted.

Section 3.3.2.5 states that approximately 2,500 CY of coal mine waste was buried in the facilities pad during construction. Appendix 3-8 contains a plate showing approximate locations of buried coal mine waste.

There is no intention of abandoning equipment underground. Should it be necessary to abandon any equipment underground, the Permittee commits to drain all petroleum products from the equipment, and show locations of abandoned equipment on a mine map that will be submitted to the Division (7.3.2 - PHC Determination, Potential Hydrocarbon Contamination). [06/02/2005]

Refuse Piles

Section 3.2.3.500 no refuse piles will exist in the permit area. Section 3.2.600 *Coal Mine Waste* indicates that underground development waste will be disposed of underground in a dry state. The acid-toxic nature of the material is discussed in Chapter 6.

Plate 3-1 shows the location of the sediment pond and ditch clean out material (behind the substation and behind the fan). The designated areas can hold 260 CY. The material may be sampled for use as substitute topsoil or fill material.

Impounding Structures

Burning And Burned Waste Utilization

Return of Coal Processing Waste to Abandoned Underground Workings

Excess Spoil:

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

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HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 773.17, 774.13, 784.14, 784.16, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -300-147, -300-148, -301-512, -301-514, -301-521, -301-531, -301-532, -301-533, -301-536, -301-542, -301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.

Analysis:

General

Steve and Pete Stamitakis stated in their letter to the Division that monitoring had not been done "since Horizon left"; it isn't clear what date or event this refers to, but some of the monitoring was not done in 2000. There have also been quarters when there was no access for some monitoring sites because of snow cover. Data in the Division's database indicate that the monitoring plan described in the MRP has basically been followed and reporting to the Division is up-to-date. (6/2/2005)

The Permittee has committed to monitor significant surface- and ground-water sources, including drainages above and below the disturbed mine site area, and all point-source discharges. (6/2/2005)

Soils at the site tend to be silty clay loam to loam within the Shupert-Winetti Complex and gravelly loam to loam within the Brycan, Rabbitex, Senchert and Curecanti Series. The SCS information the use of hydrologic groups B and C (undisturbed soils) are considered adequate. In cases where the soil phases were in group B or C the operator used group B.

The operator has used a CN of 89 for the undisturbed areas. This number is adequate at this time. However, should the operator propose additional buildings, road surfacing or pad surfacing the design CN would require re-analysis. The operator used a CN of 70 for the additional areas draining to the pond considered "undisturbed" by the operator. Some of these areas are disturbed from previous mining operations.

Groundwater Monitoring

The Ground-water Monitoring Plan is in Section 7.1.5. Operational and reclamation ground-water monitoring parameters are in Table 7-2. Ground-water monitoring during operation of the mine will be conducted in accordance with R645-301-723. (6/2/2005)

Water levels in the piezometers have been measured quarterly; results are tabulated in Table 7-1 of the MRP and are in the Division's database. (6/2/2005)

The operator committed to submit quarterly and annual reports. The operator includes a commitment to notify the Division if data indicate non-compliance with permit conditions.

The operator has stated that springs monitoring data will provide information or impacts to localized perched aquifers within the Blackhawk Formation. It is established that these aquifers are associated with fault systems. Similar information will be obtained by monitoring inflows. The HZ

monitoring wells will assist in evaluation potential losses of ground water from the Blackhawk and Star Point formations.

Environmental Resource Description, Hydrology

Specifics in monitoring during the construction period were included and the operator has committed to collect weekly samples during the operational and reclamation construction period up stream and downstream of construction. The parameter is to be analyzed in the field is turbidity.

(06/02/2005)Surface Water Monitoring

Surface-water quality data have been collected from the permit and adjacent areas since 1989. Table 7-5 lists the operational and reclamation surface water monitoring parameters. The baseline data collected from the monitored sites, together with tables outlining the parameters that have been monitored, are presented in Appendix 7-3. Data are also in the Division's database. (6/2/2005)

Discharges of water from this operation will be made in compliance with all Utah and federal water quality laws and regulations and with effluent limitations for coal mining promulgated by the U. S. Environmental Protection Agency set forth in 40 CFR Part 434. See Sections 731 and 742.

Acid- and Toxic-Forming Materials and Underground Development Waste

Drainage from acid- and toxic-forming materials and underground development waste into surface water and ground water will be avoided by implementation of a Spill Prevention Control and Countermeasure (SPCC) Plan and by the following:

Potentially acid- or toxic-forming materials will be identified by use of Material Safety Data Sheets (MSDS), or by direct sampling and analysis in the case of underground development waste.

The operator has indicated that overburden and underburden samples will be gathered at 2,000-ft intervals throughout the mine and tested according to the Division requirements (Section 6.5.7.1). The Division understands this statement to mean the operator will test the materials according to current Division guidelines for acid and toxic forming materials. See further discussions under **Acid and Toxic** headings of this T.A.

Any material which exhibits acid- or toxic-forming characteristics will be properly stored, protected from runoff, removed to an approved disposal site or buried on site beneath a minimum of 4' of non-acid, non-toxic material.

Storage of potentially acid- or toxic-forming materials, such as fuel, oils, solvents and non-coal waste will be in a controlled manner, designed to contain spillage and prevent runoff to surface or ground-water resources.

All oils and solvents will be stored in proper containers within enclosed structures. Fuels will be stored in appropriate tanks, enclosed within concrete or earthen bermed areas designed to contain any spillage.

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Non-coal waste (garbage) will be stored in a designated location, in dumpsters, and removed to an approved landfill (East Carbon Development Contractors - ECDC) on a regular, as-needed basis.

Transfer of Wells

There are presently three monitoring wells on this permit. When these wells are no longer required, they will be sealed in a safe, environmentally sound manner in accordance with regulations.

Discharges Into An Underground Mine

There are no plans to discharge any water into an underground mine.

Gravity Discharges From Underground Mines

Based on historical data from other mines in the area, some mine water can be expected to be encountered during the mining operation. Typically, such water is stored in "sumps" or designated areas in the mine and used for mining operations or discharged to the surface.

Water-Quality Standards And Effluent Limitations

Any discharge will be made in compliance with all Utah and federal water quality laws and regulations and with effluent limitations for coal mining promulgated by the U.S. Environmental Protection Agency set forth in 40 CFR Part 434.

A copy of the UPDES general discharge permit UTG 040019 is in Appendix 3-6. Temporary mine discharge quantities will be reported monthly and submitted to the Division with quarterly monitoring data. Reports will contain the period of pumping and the daily flow rate - unless flow is continuous. A continuous flow meter was installed in 2001 and has been used to report mine discharge since that time (Section 7.1.5). (6/2/2005)

Two sites are identified under the permit, outfall 001, minewater discharge from the sedimentation pond to Jewkes Creek and 002, mine discharge outfall to Jewkes Creek, which indicates the Department of Environmental Quality (DEQ) accepted the use of sumps for treatment of minewater.

With the minewater being directly discharged to the bypass culvert. It will be difficult to determine the visual permitting requirements, as the discharge will mix with Jewkes Creek water before exiting the bypass culvert. Additional monitoring requirements required by the Division included: 1) collecting quarterly monitoring data from locations upstream and downstream from the disturbed area within a reasonable time on the same day, the minewater discharge sample is obtained, and 2) monitoring for the monthly maximum discharge flow rate as well as providing in-mine water consumption estimates.

The operator included a commitment to monitor discharge 002 on the same day during the quarterly sampling of surface water sites SS-3 and SS-5 according to the monthly UPDES discharge

permit to meet the Divisions Requirement. The maximum flow for the discharge point each month required by the UPDES permit.

Information on mine consumption was provided as an estimate for full production. Information providing an estimate of use for each month during production was what was intended by the requirement to get a better idea on total minewater inflow. The monthly estimates can be incorporated during future mine plan amendment changes.

Diversions: General

Undisturbed

All diversions will be constructed and maintained to comply with the requirements of R645-301-742.100 and R645-301-742.300. Details are described under those respective sections of this chapter.

Culvert details are provided in Chapter 7. Undisturbed area culvert UC-1 will receive bypass drainage from culverts UC-2 and UC-3, Portal Canyon and Jewkes Creek. The culverts are designed to pass the peak flow resulting from the 100 yr.- 6 hr. precipitation event. Calculations supporting these designs are presented in Appendix 7-4. The combined discharge for the two drainages that will be passed through UC-1 is 27.9 cfs. The 100 yr.-6 hr. peak flow to reach UC-2 is calculated to be 8.3 cfs, and the peak flow calculated at UC-2 is 19.6 cfs. Culverts

Calculations indicate that the flow capacity of the unaltered Jewkes Creek is 27.7 cfs above culvert UC-3 and 38.7 cfs below UC-1. The design capacities of the two culverts are 69.5 cfs and 100 cfs, respectively. The capacities of the culverts exceed the expected high capacity of Jewkes Creek. Culvert capacity for UC-2 is calculated to be 83 cfs. This capacity exceeds the Portal Canyon capacity of 13.1 cfs above the culvert in its unaltered state.

A trash rack has been installed on culvert UC-2. A generalized drawing of the trash rack is shown in Figure 7-8. There is no mention of a trash rack installed on UC-2 and no mention of a face protection at the culvert inlet. These culverts are temporary and will be removed during the reclamation phase.

All undisturbed and disturbed diversions are designed to carry the flow from a 10-year, 6-hour event. Culverts UC-4 and UC-5 receive drainage coming from the Jewkes Creek, an intermittent stream, designed to carry the flow from a 100-year, 6-hour event. The operator provided culvert sizes that may carry greater flows than the designed flow for the 10-year, 6-hour event.

Disturbed area diversions are designed to handle the 10-year, 6-hour event. The operator has provided a general channel configuration in Figure 7-7. The operator has stated that channel configuration may vary but the minimum cross sectional area will remain the same. The operator has met minimum design requirements. [06/02/2005]

Disturbed

There are five diversion ditches that collect the disturbed area runoff. Most disturbed area runoff will be directed to the sedimentation pond. Only two small areas at the upper end of the disturbed area

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will use alternative sediment control. Disturbed area culverts are used in conjunction with diversions to convey runoff beneath roadways and to the lower minepad. [06/02/2005]

Drainages are developed by the operator to route undisturbed drainage around the site channels. Drainages with slopes up to 0.5 ft/ft have failed when riprapped. Riprap design procedures were not based on slopes of this steepness. Adequate grading, fill and angular riprap and filter blanket designs are necessary. The operator has provided sizing for graded riprap but no filter blanket designs. It is the opinion of the Division that the operator has not minimized potential impacts to the adjacent area and undisturbed drainage slopes should be reduced where possible.

The proposed topsoil pile directs drainage from DD-3 to DC-2 into the sedimentation pond. No drainage designs specific to road drainage could be located.

Diversions: Perennial and Intermittent Streams**Diversions: Miscellaneous Flows****Stream Buffer Zones**

The operator has submitted a stream alteration permit to the Division of Water Rights. The submittal proposes a 3 foot and 2 foot culvert respectively in Jewkes and Portal Canyon. Comments on the proposal were due by May 19, 1996.

There will be no surface mining activity in the Beaver Creek watershed, so no stream buffer zone is needed along Beaver Creek to protect structures from surface activity. No diversion of Beaver Creek or other streams to the north is planned. Mining is planned beneath Beaver Creek, a perennial stream. (6/2/2005)

Subsidence protection is planned for Beaver Creek by orienting the panels perpendicular to the stream and using full extraction pillaring (3.2 - Surface Facilities Construction Plans, Subsidence Protection). Retreat mining results in uniform downwarping and lowering of strata, generally not accompanied by a significant degree of fracturing, and the original attitude and integrity of the strata are maintained. Little impact on the perched aquifers of the overburden is expected to result from downwarping (7.3.2 - PHC Determination, Impacts to the Perched Aquifer System). (6/2/2005)

Overburden isopach and coal seam thickness are shown on Plate 3-3. Table 6-2 lists depths to the top of the Hiawatha Seam as measured in five bore holes. Plate 3-3 and the cross section on Plate 6-2 indicate a thickness greater than 800 feet. Appendix 7-13 contains a copy of the US Forest Service study of the impacts of subsidence caused by full extraction mining beneath Burnout Canyon at the Skyline Mine. The conclusions from Burnout Creek, which relate to overburden being over 800 feet thick, have been used to predict that subsidence will cause only minor and temporary impacts to Beaver Creek (7.3.2 - PHC Determination, Impacts to the Hydrologic System Resulting From Subsidence). (6/2/2005)

No surface structures exist within the zone of potential subsidence (Section 3.3.2.2). There are, however, private unpaved roads adjacent to Beaver Creek, in Sand Gulch, and in an unnamed side canyon to Jump Creek that could be affected by subsidence. Subsidence of roads is allowed by the Coal Mining Rules, but it is reasonably foreseeable that damage to these roads from subsidence could result in diminished use. Section 3.2.3.4 discusses potential damage to these roads and includes a commitment to maintain and repair these roads. (6/2/2005)

Sediment Control Measures

Horizon Coal Company has committed to limit construction to periods when the stream is not flowing to the extent possible. The proposed measures for culvert construction are acceptable practices. Appendix 3.3 indicates the road will be sloped toward the disturbed drainage ditches. [06/02/2005]

Ditch UD-2 receives extensive drainage from cut slopes as shown in Plate 3-7A, cross sections E, F, and G. These slopes are steep and can be significant sources of sediment. The operator has committed to provide erosion control matting and seeding according to Table 3-2, for all cut slopes which will drain directly to an undisturbed area diversion. As presented in Section 3.3.5.3 mulching and roughening will occur on areas before seeding where slopes are 2½:1 or less. The matting will be applied on slopes 2½:1 or steeper. It should be noted that where competent bedrock is exposed matting might not be practicable.

Currently this road is located on the east side of the stream and outside the permit area, and therefore is a potential source of additional sediment to the stream flow. The fan portal road is to be considered an ancillary road and will be cut into native materials without an engineered surface.

The topsoil is also proposed to be vegetated with interim cover as discussed in Sections 3.4.4.1, page 3-19 and Section 3.5.2. The piles will be contoured, fertilized and seeded. A berm will be placed around each topsoil pile to minimize soil transport. Prior to achieving adequate vegetation establishment other measures are necessary to control erosion.

Siltation Structures: General

Sediment ponds and all other treatment facilities are defined as siltation structures. The two siltation structures at this site include Sweets Pond, a pond developed for water rights use, and the sedimentation pond. For a discussion of the mine site sedimentation pond, see the **Sedimentation Ponds** heading below.

Sweets Pond currently is associated with the Gordon Creek Mines 2, 7, and 8. This site would be double permitted until Gordon Creek has obtained bond release. Because this is an impoundment to be associated with the Horizon Mine appropriate regulatory requirements must be addressed.

Sweets Pond also has an existing pumphouse and a water gate to control inlet flows. The operator has proposed to build a water line from the pond to the mine. This should be included in the permit area as part of the disturbed area. The pond itself need not be part of the permit area for which

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bonding is required as described under the "Disturbed Area" and "Permit Area" definition in R645-100, as long as the structures are constructed and maintained in accordance with R645-301 and R645-302.

Siltation Structures: Sedimentation Ponds

There will be only one sediment pond. The sediment pond will be a non-MSHA structure. The sediment pond will be inspected during and after construction by a qualified, registered, professional engineer. The pond will be inspected after each storm and cleaned as necessary. Its embankments will be vegetated, to control erosion, with a temporary seed mix as described in Section 3.5.5.2.

The operator has analyzed the pond embankment designs for stability. Using a standard, circular failure model and the Hock Circular Failure Charts, the operator has found that the pond embankments have a static safety factor of 4.81 for dry conditions and 4.44 for saturated conditions (Appendix 3).

The operator proposes to divert all disturbed area run off to the sedimentation pond, including the proposed north return air fan, receiving runoff from 10.7 acres (Appendix 7-4). The sedimentation pond will be mostly incised except at the downstream face, which will be an earthen embankment. The pond has been designed to contain the runoff from a 10-year, 24-hour precipitation event calculated to be 0.83 acre-feet. The permit area surfacing is described as a gravel parking lot. The full extent of gravel is not defined.

The operator has assumed sediment production of 0.05 acre-feet/acre from the disturbed area. The operator has not provided a technical method or calculation to determine where the 0.05 acre feet/acre comes from, Appendix 7-4. However, the final design allowed 1.48 acre-feet for maximum sediment storage, which is closer to 0.1 acre-foot/acre per year sediment production for disturbed areas and is considered a conservative estimate. Although the maximum sediment storage is considered adequate at this time, if the operator should need additional increases in the sedimentation pond capacity the 0.05 acre feet/acre will not be considered valid until demonstrated to meet standard through accepted design methods. The operator must remove the discussions of excess design capacity or provide technical design information.

The total capacity of the pond below its emergency spillway will be 2.3 acre-feet. The sediment will be cleaned out of the pond at 60% of the total sediment volume, or 0.88 acre-feet. The cleanout volume will be marked by a calibrated pole. One pole is generally not adequate to determine sediment capacity because the sediment tends to be deposited in deltaic form at the inlets. The operator will be expected to maintain the capacity required for runoff volume.

The pond will also have a 2" decant pipe with a locking valve. Twenty-four hours after a storm, the pond is to be drained by opening the valve on the two inch decant line in the pond. This valve is to remain locked at all times except when decanting storm runoff. The inlet of the decant line is to be located at an elevation of 7576.0 feet, which is 24 inches above the 60% cleanout level and 3.4 feet below the elevation of the spillway.

Should the quantity of water encountered in mining exceed the amount required by the underground operations the operator proposes the water be treated by the sediment pond in order to meet effluent standards. This action may be used as an emergency measure but is not an approved design.

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The use of the pond for this purpose would need to be approved prior to handling any runoff which might exceed the design requirements.

The sediment pond's spillway is designed to pass the peak flow of the 25-year, 6-hour precipitation event. Calculations for the spillway assume the pond is full to the elevation of the spillway prior to the onset of the event. With a depth of 2.3 feet, a width of 10 feet and side slopes of 2h:1v, the spillway will have 2 foot of freeboard between the top of the pond embankment and the maximum flow elevation. The operator designed a non-erodible, open channel emergency spillway for which the outlet will have a riprap with a D50 of 4 inches. However, no filter blanket designs were included.

Although the spillway designs meet the requirements of a single -open channel spillway design under R645-301-743.00, the spillway does not provide the protection of aquatic life through providing an oil skimmer. Because this pond will be receiving oils and grease from the site the pond should provide for some type of oil skimmer.

Pond designs, maps and calculations have been prepared under the direction and certification of Richard H. White (State of Utah, Registered Professional Engineer #7102). The information and calculations contained in Appendix 6E are also certified by Mr. White.

The pond safety factor calculations assume an 11-ft embankment height and a slope angle of 2H:1V (26.56 degrees). The soils are assumed to have soil cohesion and friction angle of 35 psi and 30 degrees respectively, which results in a safety factor of 4.81 dry and 4.44 saturated conditions.

Siltation Structures: Other Treatment Facilities

There are no Other Treatment facilities as defined in the R645 Coal Rules. Two small areas above the disturbed area have been proposed for alternate sediment control. Appropriate sediment control measures will be designed, constructed and maintained using the best technology currently available to prevent, to the extent possible, additional contributions of sediment to stream flow or to runoff outside the permit area and meet the effluent limitations under R645-301-751. [06/02/2005]

Siltation Structures: Exemptions

No exemptions requested by the operator.

Discharge Structures

The sedimentation pond discharge structure is discussed under Siltation Structures.

Impoundments

The sedimentation ponds are the only impoundments planned for this operation. [06/02/2005]

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Ponds, Impoundments, Banks, Dams, and Embankments **Casing and sealing of wells**

The operator has stated that approvals and permits to drill wells will be received from the Division of Water Rights and appropriate Government agencies. The final casing and sealing of wells is discussed in more detail in the section entitled **MINE OPENINGS** under **RECLAMATION PLAN** below.

Water Replacement

The Permittee's water-replacement commitments address elements of both R645-301-731.530 and R645-301-525.480, but the Permittee's commitments to replace water supplies and the methods described to carry out such replacement are sufficient to meet the requirements of the Coal Mining Rules. (6/2/2005)

Findings:

Operation Plan Hydrologic Information is adequate to meet the requirements of the Coal Mining Rules. (6/2/2005)

SUPPORT FACILITIES AND UTILITY INSTALLATIONS

Regulatory Reference: 30 CFR Sec. 784.30, 817.180, 817.181; R645-301-526.

Analysis:

All support facilities are described in the MRP

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

SIGNS AND MARKERS

Regulatory Reference: 30 CFR Sec. 817.11; R645-301-521.

Analysis:

Surfaces above the Federal Lease UTU-74804 are private or inaccessible lands. No signs or markers other than water monitoring location markers will be installed. The Permittee has supplied sufficient information for this section.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

USE OF EXPLOSIVES

Regulatory Reference: 30 CFR Sec. 817.61, 817.62, 817.64, 817.66, 817.67, 817.68; R645-301-524.

Analysis:

General Requirements

The Permittee will submit blasting plans prior to blasting. (6/2/2005)

Preblasting Survey

General Performance Standards

Blasting Signs, Warnings, And Access Control

Control of Adverse Effects

Records of Blasting Operations

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-512, -301-521, -301-542, -301-632, -301-731, -302-323.

Analysis:

Affected Area Maps

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Plate 1-1 shows the permit boundaries. The Division considers the permit boundary to be identical to the affected area. The Division reviewed the Plate 1-1 and found it to be adequate.

The boundaries of the disturbed area, as well as those of its component areas of previous and proposed disturbance, are shown adequately on Plates 3-1, 3-6, and 3-7.

Mining Facilities Maps

The locations and approximate dimensions of all mine facilities are shown on Plate 3-1--Surface Facilities. In This plate was certified by a professional engineer registered in the state of Utah.

Design details of the sediment pond are shown on Plate 7-6--Sedimentation Pond Detail Map. This plate was certified by a professional engineer registered in the state of Utah.

Mine Workings Maps

The mine-workings map, Plate 3-3, shows the projected angle-of-draw and the positions of the bounding faults of the graben. Plates 3-9 and 3-10 show the location and extent of known workings of active, inactive, or abandoned underground workings, including openings to the surface, within the permit and adjacent areas; also, areas within these mines that have been second mined. No previously surface-mined areas are known to exist within the permit area. (6/2/2005).

Monitoring and Sampling Location Maps

Both geologic and ground-water information were obtained from test borings done at sites designated LMC-1, LMC-2, LMC-3, and LMC-4. The locations of these sites are shown on Plate 6-1--Geology and Plate 7-1--Water Monitoring Locations.

Information on water quality and quantity was obtained from monitoring stations designated 1, 2, 3, 4, 5, 6, and 7. The elevations and locations of these sites are shown on Plate 7-1--Water Monitoring Locations.

Certification Requirements**Findings:**

The Permittee has submitted sufficient information to address this section.

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GENERAL REQUIREMENTS

Regulatory Reference: PL 95-87 Sec. 515 and 516; 30 CFR Sec. 784.13, 784.14, 784.15, 784.16, 784.17, 784.18, 784.19, 784.20, 784.21, 784.22, 784.23, 784.24, 784.25, 784.26; R645-301-231, -301-233, -301-322, -301-323, -301-331, -301-333, -301-341, -301-342, -301-411, -301-412, -301-422, -301-512, -301-513, -301-521, -301-522, -301-525, -301-526, -301-527, -301-528, -301-529, -301-531, -301-533, -301-534, -301-536, -301-537, -301-542, -301-623, -301-624, -301-625, -301-626, -301-631, -301-632, -301-731, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-732, -301-733, -301-746, -301-764, -301-830.

Analysis:

The only surface disturbance that has occurred on Federal Lease UTU-74804 is the development of water monitoring wells. Plans have been presented in the MRP that describe how the wells will be reclaimed.

Findings:

The Permittee has submitted sufficient information to address this section.

POSTMINING LAND USES

Regulatory Reference: 30 CFR Sec. 784.15, 784.200, 785.16, 817.133; R645-301-412, -301-413, -301-414, -302-270, -302-271, -302-272, -302-273, -302-274, -302-275.

Analysis:

No surface disturbance other than minimal subsidence will take place on the Federal Lease UTU-74804. The post mining land use for the area included in this application will remain the same as premining conditions, i.e. grazing, logging, mining, recreation and wildlife habitat.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

PROTECTION OF FISH, WILDLIFE, AND RELATED ENVIRONMENTAL VALUES

Regulatory Reference: 30 CFR Sec. 817.97; R645-301-333, -301-342, -301-358.

Analysis:

No surface disturbance on Federal Lease UTU-74804 is anticipated other than minimal subsidence. Beaver Creek and several springs and ponds are adjacent to or lie within the proposed permit area. The Permittee is currently monitoring Beaver Creek and certain springs, and wells in the proposed addition to the permit area (plate 7-1). The Permittee has proposed to maintain a 100' Buffer zone along beaver Creek to prevent impacts to the stream. Subsidence will be monitored during mining and for a period of two years following final cessation of mining practices. The subsidence monitoring points are identified on plate 3-3 of the application. The Permittee has been requested to develop and implement a mitigation and protection plan under the Fish and Wildlife Information section of this document. (6/2/2005)

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

APPROXIMATE ORIGINAL CONTOUR RESTORATION

Regulatory Reference: 30 CFR Sec. 784.15, 785.16, 817.102, 817.107, 817.133; R645-301-234, -301-412, -301-413, -301-512, -301-531, -301-533, -301-553, -301-536, -301-542, -301-731, -301-732, -301-733, -301-764.

Analysis:

The Federal Lease UTU-74804 proposal extends the underground operations. There is no change to the approved reclamation plans. AOC will be met.

Findings:

The Permittee has submitted sufficient information to address this section.

BACKFILLING AND GRADING

Regulatory Reference: 30 CFR Sec. 785.15, 817.102, 817.107; R645-301-234, -301-537, -301-552, -301-553, -302-230, -302-231, -302-232, -302-233.

RECLAMATION PLAN

Analysis:

General

Plate 3-1 shows the location of the sediment pond and ditch clean out material (behind the substation and behind the fan). The designated areas can hold 260 CY. The material may be sampled for use as substitute topsoil or fill material.

Contemporaneous reclamation is discussed in Section 3.5. Plate A of Appendix 8-1 shows areas, which were contemporaneously reclaimed in 1997. This work is discussed in Section 8-8.

General plans for backfilling and grading are found in Section 3.5.4. Plates 3-7 and 3-7A show the topography post-mining. Cut and fill calculations are in Table 3-1. There is a 4,240 CY deficit, which will require lowering the site 5 inches.

Previously Mined Areas

Backfilling and Grading On Steep Slopes

Special Provisions for Steep Slope Mining

Findings:

There is no change from the approved reclamation plan.

MINE OPENINGS

Regulatory Reference: 30 CFR Sec. 817.13, 817.14, 817.15; R645-301-513, -301-529, -301-551, -301-631, -301-748, -301-765, -301-748.

Analysis:

No new mine openings are proposed under the addition of Federal Lease UTU-74804 . Closure and reclamation of mine openings is discussed in Section 3.5.3.1.

Findings:

Mine Openings information for the Reclamation Plan is adequate to meet the requirements of this section.

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-240.

Analysis:

Twenty inches of topsoil will be placed over 8.23 acres of graded fill (Section 2.117). The figure of 9.15 acres was used for bonding purposes and is listed in (Section 3.5.4 and Table 3-1). This amounts to approximately 14,417 CY of topsoil (Section 3.5.4 and Appendix 8-1). There is no change from the approved reclamation plan.

Redistribution

Findings:

Sufficient information has been provided to meet this section of the regulations.

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: 30 CFR Sec. 701.5, 784.24, 817.150, 817.151; R645-100-200, -301-513, -301-521, -301-527, -301-534, -301-537, -301-732.

Analysis:

Reclamation

No roads or transportation facilities will be affected as a result of the addition of Federal Lease UTU-74804 to the permit area. The plan contains information to show that no roads or transportation facilities overly Federal Lease UTU-74804.

Retention

Findings:

Sufficient information has been submitted to address this section.

RECLAMATION PLAN

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 784.14, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-301-512, -301-513, -301-514, -301-515, -301-532, -301-533, -301-542, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-733, -301-742, -301-743, -301-750, -301-751, -301-760, -301-761.

Analysis:

Hydrologic Reclamation Plan

The reclamation plan is discussed in detail in Section 3.5 of this permit application. The Permittee has provided information in the MRP to show they will conduct reclamation activities on the minesite at completion of mining. Reclamation plans dealing with ground water are identified in the approved permit. The reclamation criteria extend to the Federal Lease UTU-74804 area. (6/2/2005)

All surface and ground-water monitoring will continue throughout the reclamation period. The permittee will monitor for acid or toxic materials and provide treatment if adverse conditions occur. Wells will be sealed and the sites reclaimed. There will be no discharges into the underground mine. The mine will be sealed and no gravity discharge is expected. All diversions will be removed and flow distributed over the surface. Sediment control measures will be implemented using the best technology available during reclamation. Sediment ponds will remain until vegetation is established and effluent limitations are met.

Four holes have been (HZ-1, HZ-2, HZ-3, and HZ-3HZ01-6-1) drilled and completed as monitoring wells within the uppermost saturated zone beneath the Hiawatha coal seam to better predict the potential of inflow into the mine. When no longer needed for monitoring or other use approved by the UDOGM and upon a finding of no adverse environmental or health and safety effects, or unless approved for transfer as a water well, each well or boring will be capped, sealed, backfilled, or otherwise properly managed, as required by regulations. (6/2/2005)

No oil and gas exploration or production wells are located in the permit area.

Subsidence of the sediments overlying the mining area will be monitored. A detailed description of the subsidence monitoring plan, including a map illustrating the location of monitoring stations, is presented in Section 3.4.8. (6/2/2005)

Findings:

The Permittee has submitted sufficient Reclamation Plan information to meet the minimum requirements of the regulations. (6/2/2005)

CONTEMPORANEOUS RECLAMATION

Regulatory Reference: 30 CFR Sec. 785.18, 817.100; R645-301-352, -301-553, -302-280, -302-281, -302-282, -302-283, -302-284.

Analysis:

General

No surface disturbance in Federal Lease UTU-74804 is anticipated other than minimal subsidence. Mining practices would have a minimal effect on the vegetation resources. Potential impacts to vegetation caused by subsidence during active mining operations may be mitigated by implementing Contemporaneous reclamation practices as described in Section 3.5.1 of the reclamation plan.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

REVEGETATION

Regulatory Reference: 30 CFR Sec. 785.18, 817.111, 817.113, 817.114, 817.116; R645-301-244, -301-353, -301-354, -301-355, -301-356, -302-280, -302-281, -302-282, -302-283, -302-284.

Analysis:

No surface disturbance in Federal Lease UTU-74804 is anticipated other than minimal subsidence. Mining practices would have a minimal effect on the vegetation resources. Potential impacts to vegetation caused by subsidence during active mining operations may be mitigated by implementing Contemporaneous reclamation practices as described in Section 3.5.1 of the reclamation plan.

Revegetation: General Requirements

The general requirements for revegetation are provided for in Section 3.5 of the reclamation plan.

Revegetation: Timing

The approximate schedule for reclamation activities is outlined in table 3-4 of Section 3.5.7.1 of the reclamation plan.

RECLAMATION PLAN

Revegetation: Mulching and Other Soil Stabilizing Practices

Sections 3.5.4.3, 4, 5.1.2, and 3 of the reclamation portion of the plan and proposal describe the mulching and other stabilizing practices to be implemented during reclamation.

Revegetation: Standards For Success

The standards for success are provided for in Section 3.5.6 of the reclamation plan.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

STABILIZATION OF SURFACE AREAS

Regulatory Reference: 30 CFR Sec. 817.95; R645-301-244.

Analysis:

The backfilling and grading schedule is detailed in Section 3.5.7.1 and outlined in Table 3-4.

All acid-toxic material, exposed coal or refuse will be covered with 4 feet of material. The regraded surface will be scarified. Topsoil will be replaced.

Silt fences will be used at the bottom of fill slopes and along the reclamation channel during topsoil placement. The site will be seeded and mulched as described in Section 3.5.5.3 (1 ton mulch/acre) and Section 3.5.4. Erosion control matting on slopes 2½H:1V or greater and sediment controls will be placed as needed (Plate 7-7a; Section 3.5.4.3).

Findings:

There has been no change to the approved reclamation plan

CESSATION OF OPERATIONS

Regulatory Reference: 30 CFR Sec. 817.131, 817.132; R645-301-515, -301-541.

RECLAMATION PLAN

Analysis:

Federal Lease UTU-74804 extends the underground operations. There is no change to the approved reclamation plans.

Findings:

Federal Lease UTU-74804 extends the underground operations. There is no change to the approved reclamation plans.

Ground-water monitoring

Analysis:

Both geologic and ground-water information were obtained from test borings done at sites designated LMC-1, LMC-2, LMC-3, and LMC-4. The locations of these sites are shown on Plate 6-1--Geology and Plate 7-1--Water Monitoring Locations.

Information on water quality and quantity was obtained from monitoring stations designated 1, 2, 3, 4, 5, 6, and 7. The elevations and locations of these sites are shown on Plate 7-1--Water Monitoring Locations.

Findings:

The Permittee has submitted sufficient information to address this section.

MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-323, -301-512, -301-521, -301-542, -301-632, -301-731.

Analysis:

Affected Area Boundary Maps

Plate 1-1 shows the permit boundaries. The Division considers the permit boundary to be identical to the affected area. [06/02/2005]

Bonded Area Map

Plate 1-1

RECLAMATION PLAN

Reclamation Backfilling And Grading Maps

Plate 7-7A

Reclamation Facilities Maps

Federal Lease UTU-74804 extends the underground operations. There is no change to the approved reclamation plans.

Final Surface Configuration Maps

Plate 3-7 and 3-7A

Reclamation Monitoring And Sampling Location Maps

Both geologic and ground-water information were obtained from test borings done at sites designated LMC-1, LMC-2, LMC-3, and LMC-4. The elevations and locations of these sites are shown on Plate 6-1--Proposed No. 1 & 2 Mine Geologic/Structure Map, Plate 7-1--Hydrology Map, and Plate 7-2--Drill Hole Data of the Horizon Mine Area. These plates were certified by a professional engineer registered in the state of Utah.

Information on water quality and quantity was obtained, and will continue to be obtained through final reclamation, from monitoring stations designated 1, 2, 3, 4, 5, 6, and 7. The elevations and locations of these sites are shown on Plate 7-1--Hydrology Map. This plate was certified by a professional engineer registered in the state of Utah.

Vegetation information was obtained, and will continue to be obtained through final reclamation, from transects done at locations designated A through E. These locations are shown on Plate 9-2--Vegetation Map No. 2. This plate was certified by a professional engineer registered in the state of Utah.

A network of subsidence monitoring stations will be established, subsidence data from which will be submitted to the Division with each Annual Report. Monuments will be steel rebar with aluminum caps. There will be a total of 26 stations: four base stations and 22 monitoring stations, five of which will be above Beaver Creek. The locations of all subsidence monitoring stations are shown on Plate 3-5--Subsidence Monitoring Plan. Plate 3-5 was certified by a professional engineer registered in the state of Utah.

Reclamation Surface And Subsurface Manmade Features Maps

RECLAMATION PLAN

Plate 3-1 shows surface contours of undisturbed areas adjacent to disturbed areas that are indicative of the original land slopes in the vicinity of the disturbed area and which were used to create the reclamation final contour maps Plates 3-7 and 3-7A. Plate 3-6 shows conditions prior to disturbance by Horizon.

Reclamation Treatments Maps

Plate 7-7A

Certification Requirements.

Findings:

There has been no change to the approved reclamation plan.

BONDING AND INSURANCE REQUIREMENTS

Regulatory Reference: 30 CFR Sec. 800; R645-301-800, et seq.

Analysis:

General

Form of Bond

Federal Lease UTU-74804 extends the underground operations. There is no change to the approved reclamation plans.

Determination of Bond Amount

The Division reviewed the reclamation and found that no additional surface disturbance would take place. Therefore, the Division found that the bond does not have to be adjusted at this time.

Terms and Conditions for Liability Insurance

Federal Lease UTU-74804 extends the underground operations. There is no change to the approved reclamation plans. Liability insurance will continue.

RECLAMATION PLAN

Findings:

The Permittee has submitted sufficient information to address this section.

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RECLAMATION PLAN

SPECIAL CATEGORIES

REQUIREMENTS FOR PERMITS FOR SPECIAL CATEGORIES OF MINING

INTRODUCTION

Regulatory Reference: 30 CFR Sec. 785; R645-302, et seq.

Analysis:

Findings:

EXPERIMENTAL PRACTICES MINING

Regulatory Reference: 30 CFR Sec. 785.13; R645-302-210, -302-211, -302-212, -302-213, -302-214, -302-215, -302-216, -302-217, -302-218.

Analysis:

Findings:

MOUNTAINTOP REMOVAL MINING

Regulatory Reference: 30 CFR Sec. 785.14, 824; R645-302-220, et. seq.

Analysis:

Special Permanent Program Performance Standards--Mountaintop Removal

Findings:

STEEP SLOPE MINING

Regulatory Reference: 30 CFR Sec. 785.15; R645-302-230 et. seq.

Analysis:

Findings:

PRIME FARMLAND

Regulatory Reference: 30 CFR Sec. 785.16, 823; R645-301-221, -302-300 et seq.

Analysis:

Prime Farmland Application Contents.

Consultation with Secretary of Agriculture.

Issuance of Permit.

Soil Removal and Stockpiling

Soil Replacement

Revegetation and Restoration of Soil Productivity

Findings:

COAL PREPARATION PLANTS NOT LOCATED WITHIN THE PERMIT AREA OF A MINE

Regulatory Reference: 30 CFR Sec. 785.21, 827; R645-302-260, et seq.

Analysis:

Findings:

SPECIAL CATEGORIES

OPERATIONS IN ALLUVIAL VALLEY FLOORS

Regulatory Reference: 30 CFR Sec. 822; R645-302-324.

Analysis:

Essential Hydrologic Functions

Protection of Agricultural Activities

Monitoring

Findings:

IN SITU PROCESSING

Regulatory Reference: 30 CFR Sec. 828; R645-302-254.

Analysis:

Findings:

AUGER MINING

Regulatory Reference: 30 CFR Sec. 785.20, 819; R645-302-240 et. seq.

Analysis:

Findings:

SPECIAL CATEGORIES

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT (CHIA)

Regulatory Reference: 30 CFR Sec. 784.14; R645-301-730.

Analysis:

The CHIA was updated when the south part of Federal Lease UTU-74804 was added to the permit in 2001. That revision included assessment of the entire federal lease UTU-74804. The Division has updated the CHIA for the 2005 Permit Boundary Expansion amendment, a significant revision, but there were no major changes. [06/02/2005 JDS]

Findings:

The Division has updated the CHIA as needed for the 2005 Permit Boundary Expansion amendment, a significant revision to the mine plan.

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CHIA

APPENDICES

APPENDICES

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APPENDICES

SUMMARY OF COMMITMENTS

SUMMARY OF COMMITMENTS

The summary below presents a list of commitments stated within the mining and reclamation plan (MRP). This list provides the following information for each commitment, when applicable:

- Title.
- Objective.
- Frequency.
- Status.
- Reports.
- Citation.

BEGIN COMMITMENT LIST BELOW

SUMMARY OF COMMITMENTS

PERMIT INFORMATION TABLE

PERMIT INFORMATION TABLE

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CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT (CHIA)

**UPPER GORDON CREEK
AND
BEAVER CREEK BASINS**

Horizon Mine
C/007/0020

Gordon Creek #2, #7 & #8 Mines
C/007/0016

Gordon Creek #3 & # 6 Mines
C/007/0017

Carbon County, Utah

June 13, 2005

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INTRODUCTION

I. INTRODUCTION

This Cumulative Hydrologic Impact Assessment (CHIA) is a findings document. It assesses the impacts likely to occur within a cumulative impact area (CIA), an area that identifies the limits mining will have any possible affect on the hydrologic regime.

Hidden Splendor Resources (HSR) submitted an amendment to the Horizon Mine MRP (May 21, 2004) to increase the permit from 711 acres to 1,577 acres. The additional acreage is the part of federal lease UTU-74804 that lies north of Beaver Creek. There are also some minor changes to the surface facilities. This is a significant revision of the mine plan.

Hidden Splendor Resources, Inc. has been the owner and operator of the Horizon Mine since March 2003, when it acquired the rights to the Horizon Mine from Lodestar Energy, Inc. through the US Bankruptcy Court for the Eastern District of Kentucky.

Lodestar Energy, Inc. received a permit to expand mine operations into the 406 acres of Federal Lease UTU-74804 located south of Beaver Creek in 2001. The CHIA was updated at that time. Knowledge of the hydrology north of Beaver Creek was not sufficient to allow permitting of the entire federal lease at that time.

The objectives of a CHIA document are to:

1. Identify the Cumulative Impact Area (CIA). (Part II)
2. Describe the hydrologic system and baseline conditions. (Part III)
3. Identify hydrologic resources in the impact area. (Part IV)
4. Identify standards against which predicted impacts can be compared. (Part V)
5. Estimate probable future impacts of mining activity. (Part VI)
6. Assess probable material damage. (Part VII)
7. Make a statement of findings. (Part VIII)

Material damage is not defined in either the Utah or Federal regulations. Criteria that are used to determine material damage to hydrologic resources in coal mining programs administered by other states or by the federal Office of Surface Mining (OSM) include:

- Actual or potential violation of water quality criteria established by federal, state or local jurisdictions.

INTRODUCTION

- Changes to the hydrologic balance that would significantly affect actual or potential uses as designated by the regulatory authority.
- Reduction, loss, impairment, or preclusion of the utility of the resource to an existing or potential water user.
- Short term (completion of reclamation and bond release) impairment of actual water uses that cannot be mitigated.
- Significant actual or potential degradation of quantity or quality of surface water or important aquifers.

The Utah Division of Oil, Gas, and Mining has prepared this CHIA. It complies with Federal and Utah coal regulations as found in 30 CFR 784.14(f) and R645-301-729, respectively. The last CHIA for the area was prepared February 23, 2001 and updated September 2004. In addition to reference sources cited, information has been garnered from the Horizon, Gordon Creek #2, #7 and #8, and Gordon Creek #3 and #6 Mining and Reclamation Plan (MRP), as well as U. S. Geological Survey and Utah Geological Survey hydrologic and geologic reports.

II. CUMULATIVE IMPACT AREA (CIA)

The Cumulative Impact Area (CIA) is shown on Figure 1. This CIA identifies the Gordon Creek - Beaver Creek area, an area where anticipated and past coal mining activities could interact to affect the surface and ground-water resources. The extent of the CIA is determined on the potential for hydrologic resources, their recharge source, and maximum offsite impacts by mining activities. Both surface- and ground-water resources are considered in the CIA.

The ground-water boundary was chosen to incorporate mined and proposed lease areas, fault systems, and potential mine expansion that could influence the hydrologic balance in the drainage where the mining activities are located and adjacent drainages.

The surface-water boundary encompasses portions of the Beaver Creek and Gordon Creek watersheds, which are part of the Price River drainage basin. Beaver Creek flows in a northwest direction and discharges into the Price River south of Colton, Utah. Gordon Creek flows east and joins the Price River north of the city of Price, Utah.

A ground-water CIA includes all areas between the anticipated mining operations and known aquifer discharge points. Ground water use is typically associated with small, local alluvial or colluvial aquifers and perched aquifers that are recharged within relatively small areas around the seeps and springs. Alluvial and colluvial systems correspond closely with the stream channels.

There is also ground water in deeper consolidated strata, which may have aquifer characteristics at least over a limited area. Lithologic variability within these rocks and geologic structure influence the amount and direction of ground-water flow. Because the consolidated strata in the Blackhawk Formation and Star Point Sandstone mostly have poor hydraulic conductivity, fractures - usually associated with faults - are important paths for ground-water transport. Faults themselves may act as either conduits or barriers to ground-water movement. There is extensive faulting in the CIA. Planned underground operations of the Horizon Mine take place almost exclusively in the Fish Creek graben.

The term *regional aquifer* is commonly used in the Book Cliffs and Wasatch Plateau Coal Fields to describe the saturated portions of the Blackhawk Formation and Star Point Sandstone [and sometimes other strata]. In such usage, regional aquifer usually refers to any ground water irrespective of quality, quantity, use, storage, flow and transport, and discharge. However, ground-water storage and movement in these areas is typically of a local or intermediate nature and the Division feels that, generally, there is little or no basis for describing these as regional systems.

Regional flow systems are recharged along basin divides and transport water to the valley bottom, passing beneath local and intermediate flow systems. There are saturated strata within Blackhawk Formation and Star Point Sandstone and a few seeps and springs that flow from them, but after evaluating the geologic and hydrologic evidence, the Division does not consider

the saturated strata in the Blackhawk and associated formations in the Horizon Mine permit area and adjacent areas to be a regional aquifer. The Division has adhered to the definition of *aquifer* as found in the Coal Mining Rules (R645-100-200.). The term *regional aquifer* has been deliberately avoided throughout this CHIA unless appropriate. The geologic cross-section shown in Osterwald, 1981 provides an illustration of regional hydrogeologic relationships.

Monitoring sites have been established to help identify characteristics of surface waters and ground waters, including possible interaction between them.

MINING HISTORY

Plates 3-9 and 3-10 show the location and extent of known workings of active, inactive, or abandoned underground workings, including openings to the surface, within the permit and adjacent areas, and areas within these mines that have been second mined. No previously surface-mined areas are known to exist within the permit area.

Coal mining operations began in Upper Gordon Creek drainage of the Wasatch Plateau Coal Field in the early 1920s and continued at various locations except for some brief lulls. All mining in the CIA was and will be completed underground in the Hiawatha and Castlegate A Coal Seams (Table 1) using room and pillar mining techniques. The more prominent mines in the CHIA produced more than 500,000 tons of bituminous coal. Consumers (Blue Blaze) Mines operated from 1924 until the 1940s in Consumers Canyon. The National Mine operated from 1928 until the 1950s in a canyon east of Consumers Canyon. The Sweets mine operated from 1925 to 1950 from Sweet Canyon, west and south of Consumers Canyon. The Swisher Mines operated from Bryner Canyon. The Swisher #1 Mine opened in the 1960s on the south side of Bryner Canyon. The Swisher Mines were purchased by General Exploration and shortly afterward by Atlantic Richfield Company (ARCO) in 1980. ARCO operated the Gordon Creek #3 and #6 Mines in Coal Canyon and the #2, #7 and #8 Mines in Bryner Canyon through the 1990s. Some less known mines such as the Davis, K.L. Stores, Success, Jeffery, New Ewing, and Western Mines operated in the area at various times until the early 1950s. Building remnants, debris, and coal refuse from some of those mines still remain.

Several small communities and towns such as Consumers and National sprang to life in the canyons. Consumers boasted a population of 5,000 inhabitants.

The Surface Mining Control and Reclamation Act (SMCRA), Title 95-87, became federal law in 1977. At minesites such as the Blue Blaze, National, and Swisher that operated and closed prior to passage of SMCRA, buildings, coal refuse, and debris from the abandoned mines were not required to conform to the reclamation requirements under Title V, but fell under the Abandoned Mine Lands, Title IV.

The Gordon Creek #2, #3, #6, #7 and #8 mines and the Horizon Mine were operating after passage of SMCRA and required to meet statutory operational and reclamation performance standards under SMCRA Title V requirements.

The disturbed areas of Gordon Creek #3 and #6 Mines have been reclaimed and final

CUMULATIVE IMPACT AREA

Upper Gordon Creek

bond release was granted in 1999. The Gordon Creek #2, #7 and #8 Mines are currently under reclamation, but have not received Phase 1 bond release, which comes after sealing the portals, backfilling and regrading to approximate original contour (AOC), covering the regraded area with a topsoil or substitute topsoil, roughening and preparing the surface, reestablishing drainages, and revegetating the area using an approved seed mix. Construction of the Horizon Mine covered the refuse and debris of the Blueblaze Mines.

Table 1.

Mines in Respective Coal Seams in the CIA.

Castlegate A Seam	Hiawatha Seam (Wattis Seam, Tabet, and others)
Blue Blaze #2 Mine	Sweet #1 Mine
Blue Blaze #3 Mine	National #1 Mine
Columbo Mine	Horizon (#1) Mine (Blue Blaze #1)
Gordon Creek #1 (Swisher #1)	Gordon Creek #3 Mine (Beaver Creek #3)
Gordon Creek #2 Mine (Swisher #2 Mine)	
Gordon Creek # 6 Mine	
Gordon Creek # 7 Mine	
Gordon Creek #8 Mine	

Utah's Abandoned Mine Reclamation Program (also known as Abandoned Mine Lands or AML) sealed and reclaimed five of the pre-SMCRA mines in the CIA during 1986. The Gordon Creek Project reclamation consisted of sealing portals, backfilling, regrading, and revegetating the Sweet, Swisher #1, National, Success, and Jeffery Mines. AML also conducted fire suppression work on the National Mine in the early 1980s before reclamation work could begin on the National and Jeffery Mines.

Proposed and Currently Operating Mines

Horizon Mine

Coal mining in this area of the North Fork of Gordon Creek began in the 1920s when the Consumer Mutual Coal Company was organized and opened an underground coal mine in Consumers Canyon. This operation continued into the 1940s. The Horizon No. 1 Mine, permitted and owned by Hidden Splendor Resources, Inc. since 2003, received its mining and reclamation permit from DOGM in October 1996. Room and pillar mining methods are to be used in the Castlegate A and Hiawatha Seams. Production at the Horizon No. 1 Mine commenced on January 21, 1998 in an area previously disturbed for the Blue Blaze #1 Mine.

The Horizon Mine permit area includes federal coal lease UTU-74804 (1,272 acres) and fee coal owned by Hidden Splendor Resources, Inc. (305 acres). Hidden Splendor Resources has been the owner and operator of the Horizon Mine since March 2003, when it acquired the rights to the Horizon Mine from Lodestar Energy, Inc. through the US Bankruptcy Court for the Eastern District of Kentucky. Lodestar had purchased the coal lease rights from Horizon Coal Corporation/Horizon Mining, LLC, which in turn had acquired the rights from Hidden Splendor Resources. Hidden Splendor bases its right to mine coal on the bankruptcy court's assignment of Lodestar's rights, a Designation of Operator from Lodestar, and the federal coal lease. The Horizon Mine was issued a Right-of-Way through BLM lands in 1996, which has since been incorporated into the federal lease.

Horizon Mine is 14 miles due west of Helper, Utah (Figure 2). The mine portals are located in Portal Canyon, a northeast trending side canyon of Consumers Canyon. Portal Canyon is an ephemeral drainage that joins Consumers Canyon. Jewkes Creek flows down Consumers Canyon and discharges to the North Fork of Gordon Creek.

In 2001 Lodestar Energy, Inc. received a permit to expand mine operations into 406 acres of Federal Lease UTU-74804 located south of Beaver Creek. The CHIA was updated for this 2001 expansion. Knowledge of the hydrology north of Beaver Creek was not sufficient to allow permitting of the entire federal lease at that time.

Hidden Splendor Resources (HSR) submitted an amendment to the Horizon Mine MRP on May 21, 2004 to add the remainder of lease UTU-74804, 866 acres north of Beaver Creek to the permit. This will more than double the size of the permit area, from 711 acres to 1,577 acres, so it is a significant revision (SR) to the current mine plan that requires this update of this CHIA.

The mine permit area is located in Sections 6, 7, 8, 17, and 18 of Township 13 South, Range 8 East, Salt Lake Baseline and Meridian. The revised permit area is identified by a dark blue color outline in Figure 1. Mining is in what the mine operators have called the Hiawatha Seam, but which Dave Tabet of the Utah Geological Survey (UGS) identifies as the Wattis Seam.

CUMULATIVE IMPACT AREA

Upper Gordon Creek

Access to the minesite is via County Road 290 (formerly State Highway 139), also known as Consumers Road, which runs northwest from U.S. Highway 6 between Spring Glen and Carbonville. County Road 290 is currently paved for approximately three miles and is graded gravel for the remainder of its length. The Horizon mine permit area is approximately 11.5 miles from Highway 6, and County Road 290 continues west past the Horizon mine for approximately a mile up Bryner Canyon, where the Swisher Mines were located. Access within the permit area is from another county road that branches from County Road 290 at the Horizon permit boundary and follows Jewkes Creek up Consumers Canyon, then drops down to Beaver Creek.

Other Mines

Mining in this area dates back to the 1925 when the Sweets Mine was opened. Consumers (Blue Blaze), Sweets, and National operated mines in the Gordon Creek area from the 1920s to early 1950s. The general history of the mining in this area is well known, but detailed accounts can be confusing or even seem contradictory because of changes of mine names and ownership. The following account of past mining activity is based mainly on information from Doelling (1972) and the Horizon MRP.

**Swisher # 1 and #2; Gordon Creek #2, #7 and #8 Mines
(Swisher, Beaver Creek, and Mountain Coal Companies)**

Swisher Coal Company opened the Swisher #1 on the south slope of Bryner Canyon in the 1960s, and #2 mine on the north slope. Swisher sold the mines to General Exploration Company circa 1960. Beaver Creek Coal Company, a subsidiary of Atlantic Richfield Company, purchased the mine from General Energy in 1969. The #1 mine was reclaimed by Utah's AML program in 1986.

Swisher Coal Company developed two more portals up canyon in 1969 and named the mine the Gordon Creek #2 Mine. The mine connected with the Swisher #2 mine. It remained in continuous production until October 1985. Beaver Creek Coal Company opened the Gordon Creek #7 Mine in 1984, and it was mined out and sealed in 1989. Beaver Creek Coal then opened the Gordon Creek #8 Mine in November 1989, and it was mined out and sealed in November 1990. The permit area encompasses approximately 2,300 acres on federal leases U-8319 and U-53159. Mountain Coal, a subsidiary of ARCH Minerals that initiated the mine closure, later purchased the mines. Portals were sealed and equipment and buildings were removed in 1991. Backfilling and regrading began in 1995, but the Permittee has not received Phase I bond release.

Gordon Creek #3 (aka Beaver Creek #3) and Gordon Creek #6 Mines (Mountain Coal Company)

The Gordon Creek #3 and #6 Mines are located in Coal Canyon. Room and pillar mining began at the Gordon Creek #3 mine in 1969. The #3 Mine was purchased by General Exploration Company in 1973, then by Beaver Creek Coal Company in 1980. The #6 Mine

opened in 1978. Both mines shared the same surface facilities. Coal was mined by room and pillar method and continuous miner. Both mines closed in September 1983.

The portals for the National Mine workings were in Portal Canyon, southwest of the Fish Creek Graben, but most of the workings were to the north and east, inside the graben. On several occasions, development mining in the Gordon Creek #3 Mine broke into the National Mine working (Dan Guy, personal communication).

Preliminary reclamation began in 1983. The portals were sealed and backfilled. Structures were removed shortly after sealing. The surface regrading and contouring took place in 1985 and 1986. The mine went through 10 years of vegetation growth and stabilization before final bond release in 1998. The operator demonstrated through water monitoring that surface waters in the receiving streams were not being impacted from minesite runoff. The sedimentation ponds were left on-site to collect storm runoff for cattle and wildlife use.

III. HYDROLOGIC SYSTEM

The CIA is characterized by steep canyons and forested mountainous plateaus. Streams and springs tend to be perennial in the forested uplands and ephemeral in the lower, semi-arid desert floors. Vegetation varies from Grassland/Sagebrush and Desert Shrub communities at lower elevations to Spruce/Fir/Aspen and Mountain Meadow communities at higher elevations. Steep canyon lands with mixed pinon/juniper and sagebrush characterize areas north of the CIA. These communities are generally used for wildlife habitat and livestock grazing. Alluvial fans covered with desert scrub line the Price River from its confluence with Willow Creek to Helper.

Underground mining activities influence both the surface and subsurface. Underground workings can extend for miles. The mine's surface areas are usually smaller in comparison, but exposed directly to the elements. Several of the old mine workings in the CIA were abandoned without being reclaimed, leaving unsightly coal refuse piles along the canyons. The black refuse absorbs solar energy and radiates heat, which typically hinders plant growth. The loose coal waste eroded easily due to low cohesion and inadequate stabilization from root growth. A lot of coal refuse washed down the creeks. Refuse is perched along the streambanks where the sites remain unreclaimed.

Land management activities such as oil and gas production, grazing, and logging are usually beyond the purview of the agencies that regulate coal mining; however, the activities can influence the activities of the coal mines. It is important to identify the influences of other activities and separate any of their impacts from any potential mining impacts.

Grazing, wildlife habitat, limited dispersed recreation, and timber production are other activities in the CIA. Anticipated post-mining land uses are wildlife habitat, grazing, and recreation. Water within the CIA is used for watering livestock and wildlife, mining coal, domestic supply, fisheries, and recreation. Downstream, the water is used for irrigation and industrial needs.

Logging activities along Beaver Creek in 1999-2000 caused extensive sedimentation in Beaver and Gordon Creeks. Heavy logging equipment ground soils to a powder that washed into the creeks, where the fine sediment settled over the streambeds. Heavy spring runoff made the county roads into quagmires. The logging company pushed the mud off the road into huge mounds along Jewkes Creek, and the muddy mounds easily eroded and washed down the road and Jewkes Creek to Gordon Creek, which is a protected fishery.

At a higher elevation on the county road, mud and debris washed down the county roads to a low spot where it eroded the hillside above the Gordon Creek #2 Mine. There was extensive sedimentation in the channels above the mine and along the rebuilt channels at the mine. Sediment was carried down to the sedimentation pond. The Utah Division of Water Quality and Utah Division of Wildlife Resources evaluated the impacts and expressed concern. No action was taken and no mitigation was required.

Grazing is extensive over the CIA. It has changed the riparian areas along Beaver Creek since the early 1980s. Prior to that time Beaver Creek sustained an active beaver population with several series of ponds damming the stream and supporting a willow and grass riparian habitat. The beaver were removed sometime between the mid-1980s and mid-1990s. During a site evaluation initiated by Steve Stamatakis in October 1997, who expressed concerns of subsidence and dewatering, it was found that the beaver dams had been removed and the site heavily grazed and timbered. The stream had become channelized and bank storage had been depleted.

Climate

Precipitation recording stations around the CIA are located at the Skyline Mine, the town of Price, Scofield Reservoir, and the town of Hiawatha. Climatic variations at these sites are influenced by elevation and aspect. The Skyline Mine lies in a high mountain canyon at an elevation of 8,710 ft, the town of Price lies in a river valley at an elevation of 5,700 ft, Scofield Reservoir is located at an elevation of 7618 ft - roughly the same elevation as the Horizon Mine - in a valley west of the Horizon Mine, while the town of Hiawatha lies at an elevation of 7,200 ft. Although surrounded by monitoring stations, no station is within 6 miles of the minesite.

The closest active meteorological reporting station is located at Scofield, Utah. Climatic characterization for the mine is based on historical climate data from this station and general regional climatic information. Evaporation and infiltration rates in the proposed lease and adjacent area vary with vegetation, soil type, and time of year. Average annual potential evapotranspiration in the upper Gordon Creek and Beaver Creek area is 18 to 25 inches per year (Atlas of Utah, 1981).

Temperature

Generally, the climate of the area is temperate. Temperatures reflect a typical seasonal pattern with gradual warming beginning in mid to late-March, high seasonal temperatures in July and early August, a gradual cooling beginning in late August to early September, and seasonal lows in late-December through mid-February. According to the Western Region Climate Center (WRCC), for the period 1969 to 1984, the average monthly high temperature at Scofield was 77° F (25° C) in July and the average monthly low was 0° (-18° C) in January. The recorded daily high temperature during this period was 88° F (31° C) and the low -38° F (-39° C). The average frost-free period in this area ranges from approximately 60 to 120 days.

Precipitation

The climate in the area is arid to semi-arid. In the Wasatch Plateau, the average annual precipitation varies between 6 to 10 inches in the valleys to over 40 inches on the mountains. According to Waddell (Waddell and others, 1981, Plate 2), normal annual precipitation in the area of the Horizon Mine is approximately 20 inches per year. About 65 to 70 percent of the precipitation occurs as snow during October-April. Summer rain showers in the mountains and high valleys may produce no recorded precipitation in the lower valleys. Brief but high-intensity thunderstorms in late summer and early fall contribute significant amounts of rainfall.

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Annual precipitation at Scofield averaged 17.2 inches from 1969 to 1984 (WRCC). The majority of the precipitation occurs as snowfall during the months of December, January, February, and March. Monthly average precipitation ranged from 0.85 inches in June to 1.87 inches in January, and highest average monthly snowfall was 32 inches in January.

Much of the precipitation is lost to runoff, evaporation, and sublimation, therefore minimizing the amount of water available for ground-water recharge. Price and Arnow (1979) estimated probably less than 5% of the precipitation recharges the ground-water system, which would be 0.6 to 1 inch per year. Recent studies in Australia (Barnes and others, 1994) and at the Nevada Test Site (French and others, 1996) indicate that recharge is not a linear process in arid and semi-arid environments, but rather there are threshold conditions involving the soil and the amount, rate, and timing of precipitation that must be met before recharge occurs; therefore, average annual precipitation alone may not accurately predict recharge and there may be years with precipitation but no recharge.

Wind

General regional information indicates that prevailing winds are from the west and northwest, and average wind velocities generally do not exceed 20 miles per hour. During the winter the prevailing wind direction can shift for extended periods and blow from the northeast. Exposure of plateau and ridgeline areas may produce higher wind velocities than in more sheltered slope, basin, and valley areas. Surface air movements are strongly affected locally by natural drainage patterns and diurnal temperature variations (up and down canyon winds).

Geology

The area is characterized as deeply incised *plateau topography*, with flat-topped ridges that rise above adjacent high desert lands. Moderately nonresistant fine-grained clay and siltstone units interfinger with resistant sandstone units. Erosion produces moderate to steep weathered slopes interspersed with vertically exposed resistant ledges and cliffs. The region's characteristic high topographic relief incised by steep-walled canyons is the result of extensive erosion along zones of weakness. Surface elevations vary from 5,500 ft to 9,000 ft within the CIA, with the thick sandstones of the Blackhawk and Castlegate Formations forming most of this relief.

Stratigraphy and General Lithology

General stratigraphy is shown in Figure 3. In ascending order the strata exposed in the area are the Masuk member of the Mancos Shale, the coal-bearing Blackhawk Formation, the unconformably overlying Castlegate Sandstone, the Price River Formation, and the North Horn Formation. Quaternary colluvium and alluvium are found on benches and along valley bottoms.

Lithology of the Book Cliffs and Wasatch Plateau Coal Fields results from the thick, relatively uninterrupted accumulation of sediments through the Upper Cretaceous and early Tertiary (Table 2). The Upper Cretaceous sediments of the section were deposited along the

western margins of a north-south oriented interior seaway. A rapidly rising mountain belt to the west supplied clastic material for shoreline construction in wave-dominated delta systems. Throughout Cretaceous time this seaway underwent a series of onlap (transgressive or seaway advancing) and offlap (regressive or seaway retreating) phases that deposited a number of broad delta and prodelta sheet sandstones. These sandstone tongues thicken westward and grade into back barrier, coastal and delta plain, and finally continental deposits. To the east (seaward), there is a thinning of the sandstone units and a fining of sediment sizes.

Major coal deposits found in Utah are usually on top of the offlap delta deposits, immediately landward of shoreline delta sandstone pinchouts. Coals that formed on these delta sandstone sheets are often very planar and continuous. Relatively short-term transgressive-regressive events commonly invaded the swamp systems and left interdeltatic features such as storm washover fans, tidal inlet deltas, and lagoonal muds. Landward of the shoreline coal accumulations, delta plain depositional influences such as splays, small channels, and levee deposits have generally created a series of splits in the coal section. Coal seams formed in the delta plain or lower coastal plain are much more likely to exhibit rolls or undulations, scouring by fluvial channels, and discontinuous or lenticular geometry. Coals deposited in these environments are often thinner due to decreased time available for peat deposition.

Mancos Shale

The Mancos Shale is exposed in the lower canyons of the CIA. It consists primarily of medium gray to bluish gray marine shales and siltstones interbedded with sandstones and minor amounts of limestone. The Mancos Shale, which forms the valley floor and lower slopes of the prominent cliffs, is over 4,000 ft thick in the area. The Masuk Shale, the uppermost member of the Mancos, grades upward into the basal sandstones of the Blackhawk Formation, and westward thinning wedges of Mancos Shale intertongue with these sandstones. The Mancos is a clay-rich unit and the shale beds are good aquicludes, with low horizontal and vertical permeabilities even near faults.

Star Point Sandstone

The Star Point Sandstone, the basal unit of the Mesa Verde Group, is about 440 ft thick in the CIA. The Star Point consists of interbedded cyclic layers of sandstones and Mancos Shale. The three dominant, massive sandstone tongues are identified as the Panther Canyonr, Storrs, and Spring Canyon Sandstone Members. The Spring Canyon tongue lies immediately below the Hiawatha Coal Seam.

Blackhawk Formation

The base of the Blackhawk Formation is locally comprised of five cliff-forming sandstone members: the Panther, Storrs, and Spring Canyon (the Sunnyside Sandstone) and the Aberdeen and Kenilworth Sandstones, in ascending order. The basal Blackhawk sandstones were deposited in a barrier-beach environment and intertongue with the Mancos Shale below. The sandstone tongues thicken westward and grade into the back-barrier, coastal plain, and deltaic deposits of the Blackhawk Formation. The Panther, Storrs, and Spring Canyon Sandstone Members merge to the west into one massive sandstone unit, up to 1000 ft thick, called the Star

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Point Sandstone. Lithologies are usually comprised of gradational sorted sandstones; medium-grained and cross-bedded at the top and fine-grained to silty at their base. These sandstones are generally poor aquifers, due in part to low permeability shale lenses, but ground-water transmission is greatly enhanced where these rocks are faulted, fractured, and jointed.

The aggregate thickness for the Blackhawk Formation in the area is roughly 900 to 1,400 ft. The Blackhawk Formation is the primary coal-bearing formation in the Book Cliffs and Wasatch Plateau Coal Fields. The important coal seams occur in the lower 500 ft. Thick and laterally extensive seams are closely associated with shoreline barrier-beach sands. Resting on and landward of the barrier-beach sandstones are lenticular sediments including reworked tidal channel-fill sandstones, fluvial sandstones, mudstones, siltstones, claystones, and coals deposited in back-barrier, lower coastal plain, and deltaic environments. Claystones contain high percentages of montmorillonite and other swelling clays.

There are two coal seams of economic interest at present. These are the Castlegate A Seam, Figure 4, which lies above the Aberdeen Sandstone Member of the Blackhawk Formation and the Hiawatha Seam (Wattis, after Tabot 1999), Figure 5, sits directly on the Star Point Sandstone.

(Recent geologic evaluation of the coal seams by personnel of the Utah Geological Survey presents an updated nomenclature of the coal seams in the northern Wasatch Plateau. David Tabet and others (1999) present a revised stratigraphic sequence to the commonly identified Hiawatha Coal Seam. They report that it has been common practice to name the basal coal seam lying above the Star Point Sandstone the Hiawatha coal seam. Their study shows that the commonly identified Hiawatha Seam correlates with the Axel Anderson Seam in some places and the Cottonwood Seam in other places.)

Fluvial channel sandstones are found in the lower Blackhawk but are more frequent toward the top of the formation. These sandstones are local in extent, generally fine grained, and well cemented. They have localized high clay content. The discontinuous character of these channel sandstones and the abundance of clay throughout the Blackhawk Formation produce perched aquifers and favor formation of local flow systems that discharge through numerous seeps and springs.

Castlegate Formation

Unconformably overlying the Blackhawk Formation are the massive cliff-forming sandstones of the Castlegate Sandstone. This formation is characterized by fluvial sands, probably deposited in a braided stream environment that progressed seaward over the deltaic and coastal plains (Van de Graff, 1982). The Castlegate Sandstone is good aquifer material, with seeps and springs common at the Castlegate-Blackhawk contact. In the Price River area the Castlegate Sandstone can be subdivided into three generic members with an aggregate thickness of about 630 ft. The Castlegate Sandstone is the remnant of coastal and fluvial deposition during a rapid retreat of the Upper Cretaceous Seaway in the area. The Castlegate Sandstone is exposed along the ridge in the northern part of the CIA. Tertiary rocks of the Wasatch Group form the uppermost exposures in areas south of the CIA.

Price River Formation

The Price River Formation overlies the Castlegate Sandstone. This formation consists of fluvial pebble conglomerates and coarse-grained sandstones. The remainder of the Price River Formation is comprised of fine-grained sandstones and slope-forming mudstones and siltstones totaling approximately 650 ft in thickness.

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Table 2 - Generalized Stratigraphic Section

System	Series	Stratigraphic Unit		Thickness (ft)	Description
TERTIARY	Paleocene	Wasatch Group	Flagstaff Limestone	200 - 1,500	Dark yellow-gray to cream colored, dense, cherty, lacustrine limestone with thin interbeds of gray and gray-green shale. Minor amounts of sandstone and volcanic ash, with pink calcareous siltstone at the base in places. Ledge former. Many springs originating from this unit have large discharge rates shortly after snowmelt with rapid decrease, indicating large transmissivity and small storage capacity characteristic of solution-cavity ground-water systems.
CRETACEOUS	Danian?	Mesaverde Group	North Horn Formation (Lower Wasatch)	500 - 2,500	Variegated shale and mudstone interbedded with sandstone, conglomerate, and limestone, all of fluvial and lacustrine origin. Ledge former. Many springs originate where low permeability layers intersect the land surface, indicating perched ground-water systems.
	Maestrichtian				
	Campanian		Price River Formation	500 - 1,000	White to gray, gritty, calcareous to argillaceous sandstone interbedded with subordinate carbonaceous shale and conglomerate. Ledge and slope former.
			Castlegate Sandstone Member	100 - 500	Coarse-grained fluvial sandstone, pebble conglomerates, and subordinate zones of mudstone. Cliff former. High permeability but largely unsaturated. Seeps and springs with seasonal variability are common.
			Blackhawk Formation	900 - 1,400	Fine to medium grained, thin to thick bedded, massive fluvial channel sandstone, alternating with subordinate siltstones, carbonaceous shales and mudstones, and coal. Fluvial channel sandstones are more common in the upper portion. Thick, discontinuous coal seams in the lower 500 ft. Slope former with sandstone ledges. Poor aquifer material even where faulted due to the discontinuous nature of the channel sands and the swelling properties of the shales. Relatively low transmissivities. Springs have seasonal variability. In-mine flows of up to 200 gpm with rapidly decreasing discharges. The lower Blackhawk and Star Point are considered to be one aquifer.
		Kenilworth, Aberdeen, *Spring Cyn., *Storrs, and *Panther Sandstones (*Star Point)	90 - 1,000	Fine to medium grained, massive, moderately well sorted coarsening upward sandstones. Cliff forming. Subordinate siltstones and carbonaceous shale. Intertongues with the Mancos Shale below and the Blackhawk Formation above. Uppermost portion contains fluvial channel sandstones. Generally poor aquifer material yielding < 10 gpm. Springs have low seasonal variation, indicating large aquifer storage coefficient. Transmissivities are relatively large where rock is fractured and faulted with yields up to 300 gpm.	
Santonian	Mancos Shale	Masuk Shale	300 - 1,300	Slope forming sandy marine shales interbedded with sandstones and minor amounts of limestone. Grades upward into and intertongues with the overlying Star Point Sandstone. A good aquiclude.	

After Doelling, 1972

Deposition of the upper Price River Formation took place from southwest to northeast. This indicates major reorientation of area drainage patterns between the periods represented by the Castlegate Sandstone and the Price River Formation, and the contact appears unconformable at some locations.

North Horn Formation

The North Horn Formation, the youngest consolidated rocks exposed within the CIA, has a total thickness of about 2,400 ft. This unit mainly consists of basal mudstones (170 ft), a middle zone of sandstones (860 ft), mixed thin limestones and claystones (330 ft), and an upper 1,000-foot sequence of sandstones and limey sediments. Lenticular, cliff-forming (10 ft) sandstones comprise about 10 to 15% of the section. The basal mudstones represent the uppermost of the Mesozoic strata in the area. Tertiary (Paleocene) fluvial and lake deposits form the remainder.

Structure

Faults

Generally, the CIA lies within the transition between the Book Cliffs and the highly fractured strata of the Wasatch Plateau. The area is generally broken into two major folds and two systems of high angle normal faults that are NS and WNW-ESE trending. The northern part of the CIA dips gently NW-NE associated with the Beaver Creek Syncline. To the south rocks dip east and west off the Gordon Creek anticline.

The CIA contains three major fault zones: the Pleasant Valley, North Gordon, and Fish Creek Fault zones. The Gordon Creek fault zone trends north-south, and the Fish Creek fault zone trends north 60 degrees west. The faulting appears to have influenced the development of Gordon Creek and the locations of springs and seeps in the permit area. Faulting and fracturing provide conduits for surface water to enter the ground water and allow movement between aquifers. The other major structural feature potentially controlling ground-water occurrence is the Beaver Creek Syncline trending NE-SW with dip at approximately 3.5 degrees.

The Fish Creek Fault Zone forms a graben that trends northwest - southeast. The Coal Canyon Fault has a displacement of approximately 600 ft and forms the eastern boundary for the Gordon Creek #3 and #6 Mines. Similarly, an unnamed fault with 120 ft of displacement forms the southwest boundary for the Gordon Creek #2 Mine. Numerous smaller faults with displacement of approximately 3 to 40 ft were encountered in the Gordon Creek Mines. Mine maps from the Gordon Creek Mining and Reclamation Plan show northwest trending and north-south trending faults were encountered in the mines.

IV. Hydrologic Resources in the Ground-water Cumulative Impact Area

Aquifer Characteristics

A principal factor influencing the distribution and availability of ground water is geology. Lithology and structure will affect the presence of ground water and the location and rate of its discharge. The Castle Gate and upper zone of the Blackhawk produce a significant number of springs in the CIA. The Price River Formation and the Star Point Sandstone, and the Price River-Castlegate and Castlegate-Blackhawk contacts also yield spring discharge although at a lower frequency. Some discussions of the Blackhawk-Star Point strata identify these as an important regional aquifer; however, although these strata are widespread and continuous, ground-water storage and movement is typically on a local or intermediate scale and the Division feels that there is no basis for designating these strata as a regional aquifer.

The Star Point Sandstone consists of the Panther (lowest), Storrs, and Spring Canyon (highest) Sandstone Members. The Spring Canyon Member is composed of fluvial shales siltstone and channel sandstones. The Star Point is approximately 900 ft thick in the Gordon Creek area. Recharge to the Star Point occurs primarily from vertical movement through the Blackhawk. Unfractured Blackhawk lithologies have low hydraulic conductivities, but the vertical permeability from fractures is significant.

The Hiawatha Coal Seam in the Blackhawk Formation directly overlies the Star Point Sandstone. This seam is expected to produce water during mining. Removing coal from this zone will most likely lower the potentiometric surface of the Star Point.

The floor of the Castle Gate A Seam is carbonaceous silty shale to fine grained fluvial sandstone. The roof consists of carbonaceous silty shales over 80 % of the permit area and the remaining 20% consists of fluvial channel sandstones that initially produce water then tend to dry up. The general channel trend is NE-SW and the channels tend to increase in frequency to the West.

The Aberdeen Sandstone overlies the Castle Gate A Coal Seam. Drill logs indicate this sandstone member is discontinuous over the CIA. The sandstone is interbedded with siltstones and shales. This sandstone is not anticipated to be a significant aquifer because it has a thin interbedded lithology and only one spring in the CIA may issue from this formation. According to information provided in the plan for the Gordon Creek #2, #7, and #8 Mines, the Aberdeen Sandstone is under artesian pressure near the junction of Jump Creek and Beaver Creek. This is on the north side of the fracture bounding the region proposed for mining.

Other strata that overlie the coal seams and have aquifer characteristics include the Castlegate Sandstone, the Price River Formation and unconsolidated alluvial and colluvial sediment deposits. The Castlegate Sandstone is exposed in the central and northeastern section of proposed mining and is approximately 300 ft thick in the Gordon Creek area. The Price River Formation overlies the Castlegate Sandstone and occurs in the northeastern portion of the permit area.

Table 3 – Hydraulic Properties of Strata in the Wasatch Plateau Coal Field

			cm/sec = hydraulic conductivity		cm ² /sec = transmissivity	
			Price River	North Horn	Blackhawk	Star Point
USGS Lab Measurements on Cores (Lines, 1985)	17-6 27bda Horizontal				Ss 5.3×10^{-6} cm/sec	
					Silt 3.3×10^{-11} cm/sec	
					Ss 3.9×10^{-6} cm/sec	
					Shale 3.9×10^{-12} cm/sec	
					Silt 7.0×10^{-11} cm/sec	
	17-6 27bda Vertical					Ss 1.1×10^{-5} cm/sec
						Ss 5.3×10^{-6} cm/sec
					Ss 1.3×10^{-6} cm/sec	
					Silt 4.2×10^{-11} cm/sec	
					Ss 1.4×10^{-6} cm/sec	
USGS Recovery or Drawdown Test (Lines, 1985)	17-6 24dcd				2.2×10^{-2} cm ² /sec (~ 3.9×10^{-6} cm/sec)	
	17-6 27bda				8.6×10^{-2} cm ² /sec (~ 4.8×10^{-6} cm/sec)	
	17-6 28bad	8.6×10^{-3} cm ² /sec (~ 5.6×10^{-6} cm/sec)				6.4×10^{-2} cm ² /sec (~ 2.6×10^{-6} cm/sec)
	17-6 34dda		1.1×10^{-1} cm ² /sec (~ 7.8×10^{-5} cm/sec)			
					7.5×10^{-3} cm ² /sec (~ 1.6×10^{-5} cm/sec)	
	18-6 4bac				1.07 cm ² /sec (~ 5.8×10^{-5} cm/sec)	
Genwal Mine Slug Tests	MRP Panther Tongue	MW-1 (1987)				3.5×10^{-5} cm ² /sec
		MW-4 (1992)				2.1×10^{-4} cm ² /sec
		MW-5 (1992)				8.8×10^{-4} cm ² /sec
	Mayo and Associates Spring Cyn Tongue	MW-2 (1997)				1.5×10^{-6} cm/sec
		MW-6a (1997)				1.3 to 1.8×10^{-6} cm/sec
		MW-7 (1997)				2.2×10^{-6} cm/sec
	Panther Tongue	MW-6 (1997)				1.9 to 2.2×10^{-6} cm/sec
Trail Mountain Mine		TM-3				5.1×10^{-3} cm/sec
Skyline Mine Hansen Associates, 1979, p. 85		Blackhawk coal			2.7×10^{-4} cm ² /sec (~ 4.4×10^{-6} cm/sec)	
		Aberdeen Ss			2.5×10^{-2} cm ² /sec (~ 2.5×10^{-6} cm/sec)	
Bear Canyon Mine Slug Tests	Panther Tongue	DH-1A				5.5×10^{-1} cm ² /sec (~ 2.6×10^{-4} cm/sec)
		DH-2				2.4×10^{-2} cm ² /sec (~ 8.8×10^{-6} cm/sec)
		DH-3				7.4×10^{-2} cm ² /sec (~ 3.4×10^{-5} cm/sec)
	Storrs Tongue	DH-1A				3.2×10^{-2} cm ² /sec (~ 1.1×10^{-5} cm/sec)
		DH-2				89.3 cm ² /sec (~ 2.7×10^{-2} cm/sec)
		DH-3				7.5×10^{-4} cm ² /sec (~ 2.8×10^{-6} cm/sec)
	Spring Cyn	DH-1A				1.4×10^{-1} cm ² /sec (~ 5.1×10^{-5} cm/sec)

HYDROLOGIC RESOURCES**Upper Gordon Creek**

cm/sec = hydraulic conductivity cm ² /sec = transmissivity						
			Price River	North Horn	Blackhawk	Star Point
	Tongue	DH-2				1.5x10 ⁻² cm ² /sec (~4.2x10 ⁻⁶ cm/sec)
		DH-3				4.0x10 ⁻² cm ² /sec (~2.0x10 ⁻⁵ cm/sec)
		DH-4				3.1x10 ⁻¹ cm ² /sec (~5.7x10 ⁻⁵ cm/sec)
Horizon Mine MRP Slug test	HZ-95-1S (shallow Blackhawk)				7.3x10 ⁻³ cm/sec	
	HZ-95-1					5.7x10 ⁻³ cm/sec
	HZ-95-2					8.8x10 ⁻⁵ cm/sec
	HZ-95-3					7.1x10 ⁻⁵ cm/sec

Falling-head permeability tests of the Mancos Shale at the Deer Creek Mine Waste Rock Storage Facility yielded values of 0.0 ft/yr for unweathered, unfractured shale and 0.0 ft/yr to 820 ft/yr (7.9×10^{-4} cm/sec) for weathered shales and mudstones.

Alluvial-Colluvial Aquifer System

The alluvial-colluvial aquifer system consists of shallow, unconfined ground water in the limited alluvial and colluvial deposits associated with surface drainage in the area. These aquifers are closely tied to the surface-water systems, with ground-water recharge occurring during periods of high flow and ground-water discharge becoming more pronounced during periods of low flow as stream levels drop below the water table. Bedrock aquifer systems may also be a source of recharge to the alluvial-colluvial systems. Unconsolidated deposits occur along valley floors and at the base of steep slopes. The thickest alluvial deposits in the permit area occur along Beaver Creek.

Water in Mines

The Gordon Creek #6 Mine was developed into the Castle Gate A Seam and the only water encountered is reported to have issued from channel sands exposed in the roof. The rate of discharge was described as dripping with no measurable inflow. Some of the formations may tend to appear dry because they lose water to fracture systems. The Gordon Creek #2, #7 and #8 Mines did not produce enough mine water to be discharged.

Much of the Gordon Creek #3 Mine was extensively developed in the Hiawatha Coal Seam. The portals of the Beaver Creek Coal Company Gordon Creek #3 Mine were located in Coal Canyon, and initial mine development was within the Fish Creek Graben (Figure 3; Figure 6-2 of the Horizon MRP). Mining proceeded to the south and west until stopped by a 40-ft fault at the edge of the Fish Creek Graben. Mining to the northeast, the workings crossed a graben or fault zone where offsets were on the order of 12 to 14 ft (from descriptions provided, it isn't clear if this was the northeast boundary of the Fish Creek Graben or a separate fault system, but mine workings crossed the northeast bounding fault of the Fish Creek Graben and extensive mining was done on the upthrown side of the fault). The mine had been dry before reaching this

faulted area, but then water began to flow through the mine floor at approximately 400 gpm as the workings were advanced. During retreat mining the faulted zone was dry.

In the Gordon Creek #3 Mine, water was produced from the roof, floor, and face but inflows at a given location dried as the face advanced. Additional water occurred along intrusive dikes, where the coal was coked, creating a more permeable zone. Earlier mining by Swisher Coal and Beaver Creek Coal Companies may have dewatered surrounding strata, providing a relatively dry mining condition for the Gordon Creek Mine.

The intent was to avoid the water-bearing fault in the Horizon No. 1 Mine. Soon after mining began, it became evident that more water was entering the mine than was expected from dewatering of the Blackhawk Formation. It was concluded that the old Blue Blaze #1 workings, connected to the Horizon Mine, had intercepted a fault, the same or similar to the one that produced the high inflow to the Gordon Creek #3 Mine, and this fault was conveying a large volume of water into the mine. As the Horizon No. 1 North Mains and adjacent panels were advanced in 2000 – 2002, they encountered the same water-bearing fault. It initially produced 450 gpm, but inflow dropped to 200 to 300 gpm within two months. When mining ceased in 2002, water continued to be pumped from the mine at 294 gpm, and in 2003 this dropped to 269. When mining resumed in August 2003, an estimated 30 gpm was flowing from the working face. As the face advances, water ceases to flow into the mine approximately 100 ft back from the active face. The Horizon Mine anticipates flow from the mine to increase to as much as 500 to 600 gpm whenever the water-bearing fault is initially encountered, diminishing to an average flow of 200 to 300 gpm.

Currently a large volume of water seeps from the hillside at the junction of Coal Canyon and the North Fork of Gordon Creek. This may be associated with a fault system. It is not known if there is a connection between the Gordon Creek #3 and #6 Mines and the spring. A vegetation change has occurred in an area below the Gordon Creek #3 Mine within the past 10 years. The area at the mouth of the canyon, on the northwest side, has been saturated with water, which has killed a large stand of aspen trees. It is undetermined why the trees have died; however, some speculate that water draining from the reclaimed mine now saturates the area and that is why the trees have died. .

Swisher Coal Company pillared the Castlegate A Seam beneath Beaver Creek in January 1978. Overburden thickness was about 650 feet. In September 1981, Beaver Creek Coal Company pillared the A Panel in the Gordon Creek #2 Mine beneath Beaver Creek, where overburden thickness was approximately 425 feet. Neither of these areas has shown any measurable effect on Beaver Creek (Section 3.4.8.4 of the Horizon MRP). [Note: It was reported in an earlier CHIA for this area that there was generally a greater amount of ground-water inflow to the Gordon Creek #2 Mine where there was less than 100 feet of overburden. Also, that a significant ground-water inflow took place when mining occurred where the operations encountered a fault under Beaver Creek, where overburden thickness was 500 ft. Water flowed into the mine at a rate of 20 to 40 gpm and was considered to be associated with the down-dropped side of the fault. Overall, ground water intercepted did not meet in-mine water supply needs and water was pumped into the mine from Sweet Canyon. In preparing the 2005 update of the CHIA, no information could be located to confirm any of this.]

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Upper Gordon Creek

A 100-foot fault lies adjacent to Gordon Creek #2 mine portal. On the opposite side of the fault is a spring with less than 1 gpm flow. According to the Gordon Creek #3 and #6 MRP, mining up to the fault did not produce significant amounts of water from the fault.

No information on in-mine ground water was available for the abandoned Sweets Mine. Surface drainage from the North Fork of Bryners ponded behind the Gordon Creek #2 mine yard, with no observable point of discharge. It has been hypothesized that this water was seeping into the Old Sweets Mine via subsidence tension cracks. Also, a spring is located where the fault zone in Sweets Canyon intersects the region of the suspected subsidence tension cracks. The fault zone is hypothesized to be the hydraulic connection between inflow to Sweets Mine and the discharge to Sweets Canyon.

The Horizon mine has developed wells in the Spring Canyon Sandstone Member of the Star Point Sandstone. The hydraulic conductivity of the Spring Canyon Sandstone was found to be 16.1 ft/day (5.7×10^{-3} cm/sec) in the fractured portion of the formation as found in HZ-95-1. The hydraulic conductivity of well HZ-95-2 was 0.25 ft/day (8.8×10^{-5} cm/sec) and HZ-95-3 was 0.20 (7.1×10^{-5} cm/sec).

Seeps and Springs

There are several springs in the vicinity of Beaver Creek and Jump Creek, Figure 6. The majority of the springs in the CIA are associated with the Blackhawk Formation. Several springs were identified as being related to faults. Jewkes Creek is fed by two springs - a perennial spring at the head of Consumers Canyon is thought to be fault related and another small spring at the fork between Consumers Canyon and Bryner Canyon. The flow coming from the later spring is intermittent. Perennial and intermittent springs appear in the Beaver Creek - Jump Creek area. Springs occur where the recharge potential from alluvium and sandstone units in the Price River Formation and Castlegate Sandstone or from fractures created by faulting is high. Ephemeral springs tend to be linked to shallow aquifers consisting of soils, alluvium or colluvium.

Ground-water discharge from the Consumers Canyon produced 200 gpm in September 1983, a high snowfall year, but 5 gpm is a representative discharge from the springs. The Gunnison Homestead and Sweets Canyon spring are also fault related.

The operators of the mines have provided information on water rights. Most springs in the Beaver Creek and Jump Creek area are used for stock watering. Seeps and springs will be monitored in accordance with the Ground-water Monitoring Plan in Chapter 7 of the Horizon Mine's MRP.

Ground-water Quality

The ground-water quality of the upper Cretaceous sediments in the Wasatch Plateau is characterized by total dissolved solids (TDS) contents of less than 1,000 mg/L. The following range of TDS measured in springs, wells, and mines issuing from or completed in formations found in the permit and adjacent areas as reported for the Wasatch Plateau and Book Cliffs areas by Waddell and others. (1981):

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Price River Formation	122-792 mg/L
Castlegate Formation	315-806 mg/L
Blackhawk Formation	63-796 mg/L
Star Point Sandstone	355-391 mg/L

Springs from the Blackhawk Formation are a calcium-bicarbonate type. Concentrations of TDS tend to vary inversely with flow, and pH of the waters is generally somewhat alkaline. Table 4 contains selected water quality data collected by mine operations and included in the Horizon mining and reclamation plan.

Table 4.
Selected Spring Sampling Summary
 (Summary of information from portions of the Horizon Mine Plan)

Sampling Point	Monitoring History	Location (Formation)	Water Quality	Water Quantity	Comments
SP-1 1989 to present	Station #1 1989 through 1993	Issues from Hillside and flows into Jewkes Creek (Blackhawk Sandstone unit above coal seams 8195 ft)	TDS 230-330 mg/L pH 7.5 - 8.5	Late Spring 10-15 gpm High flow on 5/89 was 45 gpm Late Summer/Fall 1 5 to 6 gpm	
SP-2 1989 to present	Station #2 1989 through 1993 (This description matches the station number 1 previously; Channel in North Fork of Gordon Creek.)	Issues from Hillside and usually flows approximately 100 ft (Blackhawk, 8005 ft)	TDS 480-540 mg/L pH 7.5 - 8.52	Flow in Late Spring 1-2.5 gpm Flow in Late Summer/Fall 1 <1 gpm Dry 7/1991, 8/1991, through 12/1992	Spring flows through alluvium below the point of origin.
SP-4 1989 to present	#4 1989 through 1993	Jewkes Creek Drainage flows along road empties into Jewkes Creek (Blackhawk, 8102 ft)	TDS 350-480 mg/L pH 7.5 - 9.71	Flow in Late Spring 1-2.25 gpm Flow in Late Summer/Fall 1 <1 gpm	

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Upper Gordon Creek

Sampling Point	Monitoring History	Location (Formation)	Water Quality	Water Quantity	Comments
SP-6 1989 to 1995	#6 1989 to 1995	Upstream from the proposed mine portal (Blackhawk)	N/A	Dry from 1989 through 1995	This location is not a spring and will not be included in future monitoring
2-6-W	Gunnison Homestead Spring	Tributary to Beaver Creek near confluence of spring discharge channel and Beaver Creek (Blackhawk)	Not discussed	3-136 gpm The 136 gpm included snowmelt runoff.	
SP-9	Jewkes Spring USGS 1979-1983 Station 2-5-W Beaver Creek Coal Company 1985-1995	Near Beaver Creek Channel, southwest corner of proposed LOM permit area. (Blackhawk, 8550 ft)	TDS 240-300 mg/L pH 7.5 - 8.5	Typical Late Spring flow 20 to 60 gpm decreasing late fall 1.10 to 38 gpm (Maximum flow on 7/85 was 1,372 gpm considered spurious).	Location mapped on Figure 7-3, MRP Information on flow discussion in Section 7.2.2.2 varies from Section 7.1.2.2

Two water quality samples were collected in the Blue Blaze No. 1 Mine workings, in May 1992 and one in November 1995. The water was determined to be a calcium bicarbonate type with TDS ranging from 414 to 452 mg/L and pH from 6.8 to 7.66. Ground-water samples collected in-mine at the Horizon #1 Mine in 1995 and 1996 show pH ranging from 7.38 and rising to 8.36, with specific conductance ranging from 485 to 595 ohms.

Surface Water

The CIA lies within the Price River Basin, Figure 7. Major drainages within the CIA are Beaver Creek north of the mine site, and the North Fork of Gordon Creek and Gordon Creek

south of the mine site. They drain into the Price River, which is tributary to the Green and Colorado Rivers. The disturbed area drains into the North Fork of Gordon Creek.

Beaver Creek has a drainage area of approximately 16,700 acres. Smaller drainage basins in the Beaver Creek Drainage include Jump Creek, Sand Gulch, Johnston Creek, and unnamed perennial, intermittent and ephemeral drainages. Johnston Creek is at the downstream boundary of the CIA.

Beaver Creek is a perennial stream with base flow maintained by seeps and springs. Beaver ponds are common in Beaver Creek (although not as numerous as in the past: beaver were removed sometime between the mid-1980s and mid-1990s) and also play a part in maintaining perennial flows. Springs contributing to baseflow include the Gunnison Homestead Spring, less than one mile west of the proposed additional lease area, and Jewkes Springs one mile west of the permit area, near the north west corner. Discharges from these springs vary between 3 to 136 gpm and 1.1 to 38 gpm respectively.

The USGS maintains a gauging station (09312700) several miles northeast of the permit area, near the mouth of Beaver Creek, with a period of record from 1960 through 1989. The minimum annual discharge for this period was 338 acre-ft in 1961. The maximum annual discharge of 1,610 acre-ft occurred in 1973. The average annual discharge for the 29-year period of record was 3,310 acre-ft. Decreases in downstream flow are observed in Beaver Creek between monitoring stations SS-7 and SS-8. The decrease is most prevalent during the low-flow season. The loss of water along this section may be due either to alluvium, fracture and fault systems, or unknown factors.

The main water source in the Gordon Creek drainage is the North Fork of Gordon Creek, which is a perennial stream. The North Fork of Gordon Creek flows alongside County Road 290 southeast of the permit area. The total drainage is about 12,000 acres. Other principal drainages include Jewkes Creek (a perennial stream), Bryner Canyon, Consumers Canyon, Sweets Canyon and Coal Creek.

The State Division of Water Quality classifies Gordon Creek as Class 3C and Class 4 waters. These classifications are designated as non-game and aquatic life, and agricultural uses, respectively. Beaver Creek, located over the future proposed mine workings, is classified as 1C and 3A, designated as domestic and agricultural uses respectively. There are fisheries downstream of the proposed disturbed area in the North Fork Gordon Creek.

Surface-water Quantity

Streams within the CIA receive their maximum flows in late spring and early summer as a result of snowmelt runoff. Flows decrease significantly during the autumn and winter months.

According to information presented in the 1989 CHIA 50% to 70% of the runoff occurs during May and July snowmelt. Summer thunderstorms may cause localized occurrences of short duration high intensity runoff.

Beaver Creek has a drainage area of approximately 16,700 acres, an average annual precipitation of 23 inches, and an average annual streamflow of 2,860 acre-ft (Waddell, et. al.

HYDROLOGIC RESOURCES**Upper Gordon Creek**

1986). Beaver Creek is a perennial stream with base flow maintained by seeps and springs, such as the Gunnison Homestead Spring (2-6-W), and Jewkes Spring (SP-9), shown on Figure 6. Discharges from these springs vary between 3 to 136 gpm. Jewkes Spring was observed to have dry periods. Beaver ponds used to be more common in Beaver Creek and played a part in providing perennial flows. Most of them have been removed, which has left the stream channelled, resulting in less bank storage.

Decreases in downstream flow were observed in Beaver Creek between monitoring stations SS-7 and SS-8, monitored by Horizon Coal Mining Co. The decrease is most prevalent during the low flow season. This losing stream section may occur due to alluvium, fracture and fault systems; previous mining activities; or other, unknown factors. Flows monitored by the Beaver Creek Coal Company at stations 2-4-W and 2-3-W showed an average loss in flows from the upstream and downstream station. Flow ratios varied between 68% to 91% with an average of 80%. The mean flow for the upper station in 1988 was 176 gpm, and while the mean flow at the lower station was 221 gpm. A study of flows determining existing losing and gaining reaches was conducted in September of 1996 by Horizon.

The North Fork of Gordon Creek begins in Sweets Canyon. It is perennial and receives its flow from springs, which potentially intersect ground water from the Star Point Sandstone. The total drainage is about 12,000 acres. There is no flow data available for the North Fork of Gordon Creek below all mine operations. However, Beaver Creek Coal Company had established a stream sampling station below the Gordon Creek #2, #7 and #8 Mines in the North Fork of Gordon Creek. Observations from monthly flows data in 1988 ranged from 87 gpm to 359 gpm with a mean flow rate of 190 gpm.

Jewkes Creek flows down Consumers Canyon and drains a watershed slightly greater than 1 square mile. It discharges into the North Fork of Gordon Creek. Jewkes Creek is perennial due to flow from a developed spring (SP-1) on the left fork. Flow in Jewkes Creek has varied from about 200 gpm to 5 gpm. The flow data indicate that normally the creek flows all year at Horizon's monitoring Station #5, but becomes intermittent at Station #3, a few miles below the mine, where it infiltrates into the alluvium and does not reappear immediately. Water may reappear where the Mancos shale outcrops. Diminished flows are caused by infiltration of the flow and a reduction of recharge flow. Bryner Canyon's drainage basin is about one square mile. Bryner is an intermittent stream with flow usually occurring with rainstorms and spring runoff as a result of snowmelt periods. Flows up to 3.6 cfs have been measured. Intermittent springs and seeps were found in the drainage. The main spring discharges from below the Castle Gate A Coal Seam, above the Gordon Creek #2 mine pad. Flow was estimated to vary from 1 to 5 gpm. Flows which have accumulated in the channel seldom continued beyond the Gordon Creek #2, #7 and #8 Mines disturbed area. The general opinion is that this water has been infiltrating into old mine workings associated with the Swisher Mine.

The Coal Canyon drainage area is approximately 1,329 acres and is ephemeral in nature. One flow measurement was obtained in Coal Canyon above the Gordon Creek #3 and #6 Mines during spring runoff: flow was approximately 1.6 gpm. However, since reclamation, UDOGM personnel have observed greater flows in the channel during onsite inspections. Springs at the tributary of Coal Canyon contribute significant flow to the North Fork of Gordon Creek.

The Beaver Creek Drainage and Gordon Creek drainage have numerous springs which contribute to base flow of streams. All of the drainage and many of the springs provide a point of use for water rights. Water rights are used for stockwatering and irrigation.

Surface-water Quality

Regional studies by the USGS and others indicate that, the general chemical quality of surface water is relatively good in the headwaters of Gordon Creek. TDS are usually less than 500 mg/L and the water signature is a calcium-bicarbonate type. Near the confluence of Gordon Creek and the Price River the water signature changes to a magnesium-sodium-calcium-sulfate type water with dissolved solids content as high as 1100 mg/L (Mundorff, 1972). These changes in water quality are caused by water contact with Mancos shale and irrigation return flows. The Gordon Creek mines and Horizon Mine established water-monitoring plans to assess changes in water quality leaving the permit areas.

Mean TDS at the upper Gordon Creek #2, #7 and #8 monitoring station 2-4-W (1980 – 2001) was 286 mg/L. The lower station, 2-3-W, had a mean TDS of 313 mg/L over the same period. Values at these stations were generally less than 500 mg/L, although a 1,900 mg/L spike was reported in September 1996 at 2-3-W. The mean TDS for Bryner Creek at station 2-2-W was 441mg/L and ranged from 150 to 4,000 mg/L. Data from early mining operations are not extensive. Because mining had already occurred in the CHIA prior to enactment of SMCRA, the pre-mining characteristics are not available.

TDS concentration of Beaver Creek varies from about 200 to 350 mg/L and is lower than Jewkes Creek, which typically ranges from 300 to 500 mg/L. The pH of Beaver Creek is typically 7.5 to 8.5 and Jewkes Creek generally varies from 8.0 to 8.6. Both Jewkes Creek and Beaver Creek are typically a calcium bicarbonate type water. Dissolved constituents tend to be inversely proportional to flow while total constituent concentrations tend to be directly proportional to flow. The ranges of water quality observed from 1992 through 2004 for the Horizon Coal Company are presented in Table 5.

TABLE 5
SURFACE-WATER QUALITY
Horizon Mine Data Summary

Station	Period Sampled	Total Fe mg/L	Total Mn mg/L	TDS mg/L	TSS mg/L	pH
SS-3	Jewkes Creek 1992-2004	ND - 51	ND - 1.9	55 - 1,446	ND - 5,900	6.2 - 9.2
SS-5	Jewkes Creek 1992-2004	ND - 15	ND - 0.51	313 - 606	7 - 929	7.8 - 8.2
SS-7	Jewkes Creek 1992-2004	ND - 5.2	ND - 0.20	182 - 360	ND - 306	5.1 - 8.8
SS-8	Beaver Creek 1992 - 2004	ND - 2.4	ND - 0.14	192 - 431	ND - 145	7.8 - 8.6
SS-10	Jump Creek 1996 - 2004	ND - 4.6	ND - 0.26	60 - 291	ND - 51	7.2 - 9.0
SS-11	Sand Gulch 1996 - 2004	0.3 - 3.4	ND - 0.39	108 - 388	ND - 96	7.0 - 8.6

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Upper Gordon Creek

Sediment Yield

The potential for increased suspended solids and sediment loading to Gordon Creek is probably highest during the construction phase of operation and reclamation. Hidden Splendor Resources has committed to monitor for turbidity of the water upstream and downstream of the site during the construction phases. A criteria for Class 3C allows a turbidity increase of 15 (NTU).

Increases in sediment during the operational period have been minimized through the use of disturbed and undisturbed area drainage controls. Undisturbed drainage is diverted away from the disturbed areas of the mines, while disturbed drainage controls such as ditches, berms, and culverts control and direct runoff and sediment to sedimentation ponds.

Runoff and sediment controls have been constructed at the Gordon Creek #3 and #6 Mines, Gordon Creek #2, #7 and #8 Mines and Horizon Mine. The ponds are still in place at the Gordon Creek Mines. The Horizon Mine's sedimentation pond is located in Consumers Canyon. Hidden Splendor Resources has committed to store snow in sites that will directly drain to the sedimentation pond. During the reclamation period, a combination of alternate sediment control measures and sedimentation ponds will be used.

During the late 1990s, logging was done in the Beaver Creek area on Stamatakis property. Logging and transport activities disturbed substantial areas along the roads and riparian areas of Beaver Creek, the North Fork of Gordon Creek and Jewkes Creek. Trees were removed from the property and transported out over the county road that connects to State road 139, the North Fork of Gordon Creek. There were no Best Management Practices used for sediment control on this logging site. Sediment yield from the logging sites and roads has been substantial. During the summer of 1997 the team conducting a subsidence evaluation noticed areas had been logged down to the Beaver Creek without a protection barrier. Sediments from the logging sites and access road flowed directly into the creek. Trees and branches littered the side of the creek. The dirt road along Beaver Creek was ground to a fine powder, in some places as much as 1 foot deep. The point bars and bottom of Beaver were covered with silt.

Logging continued during the winter months. As roads became muddy, the logging company used graders and bulldozers to excavate the muddy layers, which were pushed in mounds above the roads and creeks where they could easily flush into Beaver Creek and Jewkes Creek. The total effects from logging have not been quantified, however sediment loading was very noticeable and likely effected the invertebrate population.

Spills

The operator of the Horizon Mine, Hidden Splendor Resources, Inc., indicates diesel fuel, oils, greases and hydrocarbon products will be stored above ground and may be spilled in the mine and on the surface during mining operations. The operator proposes the berm surrounding the tank will be adequate to contain the total volume of the tank, in the event water needs to be drained from the berm. Spills will be handled in accordance with the Spill Prevention, Control, and Countermeasure (SPCC) Plan in Appendix 7-10 of the Horizon MRP.

The operator can provide additional reasonable operation measures to minimize hydrologic impacts on and off the permit area.

Recharge

Recharge to springs and seeps in the CIA originates in the small drainage or basin in the immediate vicinity. The low hydraulic conductivity of the rocks limits recharge, although fractures are locally important in recharge and ground-water flow. Waddell (1986) showed that springs in the in the upper reaches of Beaver Creek, in the Castlegate Sandstone and some members of the Blackhawk Formation, are very responsive to precipitation events. They usually have high, steep hydrographs responding to rapid recharge. Springs that are associated with regional aquifers or faults often have longer less fluctuating hydrographs. Low precipitation and high evapotranspiration limit the amount of water available for recharge.

Recharge can occur where permeable strata outcrop and are exposed to direct precipitation and near-surface infiltration. Recharge percolates from the surface downward until shale is encountered and then moves downdip following discontinuous, but more permeable sandstones. Water either continues to move downdip until it is discharged at the surface or resumes vertical flow where more permeable zones are encountered, and recharge eventually reaches the deepest aquifer. Vertical ground-water movement through the overlying sediments is minimal due to the low permeability of the overlying units and the presence of relatively impermeable shales. Steep slopes and relatively small outcrop exposure areas are two factors that limit recharge. Faults and fractures are important ground-water conduits in the CHIA.

Recharge to the Blackhawk Formation and Star Point Sandstone aquifer can occur where formations are exposed and come in direct contact with surface runoff or the alluvial systems, such as in sections of Beaver Creek. Recharge to ground water is limited by formation permeabilities.

Perched Ground-water System

Perched aquifers in the Wasatch Plateau and Book Cliffs typically occur in numerous small, localized lithologic units that have sufficient permeability to store and transmit ground water. They are found at shallow depths in the Flagstaff, North Horn, and Price River Formations and upper portions of the Blackhawk Formation. The Blackhawk Formation contains small, perched aquifers that are dominantly interbedded sequences of shale, siltstone, and fluvial channel sandstones. In some larger sandstone units of the Blackhawk Formation fine grained, cemented sandstones are typically the water-bearing units with lower permeability siltstones and relatively impermeable shales acting to confine ground-water movement. Burned-out coal zones also have good permeability and can be perched aquifers. Isolated perched water tables may occur deeper in the rock where more permeable zones are encountered.

Perched aquifers are of limited areal extent and thickness because of the discontinuous or lenticular shape of the sandstone bodies. Variations of permeability within the sandstone bodies further limit storage and movement of water, and perched aquifers can be breached and truncated by deeply eroded surface drainage. The discontinuous character of the sandstones and the abundance of clay throughout the formations favor formation of local flow systems that discharge through numerous small seeps and springs.

Discharge from perched aquifers is primarily from seeps and springs at outcrops of sandstone-shale interfaces. Discharge from the perched ground-water systems to deeper strata can also occur due to fracture or fault related secondary permeability: such vertical movement is significant in the CIA because of the abundance of faulting and fracturing.

Perched aquifers are generally recharged within small areas in the immediate vicinity of the seeps and springs where they discharge. Recharge is almost exclusively by infiltration of direct precipitation and snowmelt, and discharge from these aquifers closely tracks precipitation rates. The combination of steep terrain and relatively low permeabilities probably limit infiltration to less than 5 percent of annual precipitation (Price and Arnow, 1979).

Regional Aquifer System

The term *regional aquifer* is commonly used in the Book Cliffs and Wasatch Plateau Coal Fields to describe the saturated portions of the Blackhawk Formation and Star Point Sandstone [and sometimes other strata]. In such usage, regional aquifer usually refers to any ground water irrespective of quality, quantity, use, storage, flow and transport, and discharge. However, ground-water storage and movement in these areas is typically of a local or intermediate nature and the Division feels that, generally, there is little or no basis for describing these as regional systems.

There is ground water in these deeper, consolidated strata, and they may have characteristics of an aquifer at least over a limited area. Lithologic variability within these rocks influences the amount and direction of ground-water flow. Because the consolidated strata in the Blackhawk Formation and Star Point Sandstone mostly have poor hydraulic conductivity, fractures and faults are important paths for ground-water transport. Faults may act as either conduits or barriers to ground-water movement. There is extensive faulting in the CIA: planned underground operations of the Horizon Mine are almost exclusively within the Fish Creek graben. Because the Blackhawk Formation includes the primary coal-bearing sequence, ground water in this formation can be directly affected by the mining operations.

Water is unable to flow downward through the Mancos in any significant amount but will flow laterally through more permeable overlying strata until it discharges at the surface. Springs discharge along the Blackhawk-Mancos contact in Coal Canyon and Bryner Canyon. Leakage to the Mancos and other underlying units is minimal.

Stored Mine Water System

Coal mining during the past 70 years has resulted in extensive underground mine workings in the CIA. The mine workings follow the attitude of the coal and stratigraphy. As the mine moves deeper into the mountain it can extend into the local ground-water table: this appears to be the situation with the current Horizon Mine. A mine can also come in contact with new facies where water is stored or fractures are connected with the perched ground-water system. The Gordon Creek #3 Mine encountered a fault that produced substantial amounts of water until it was drained.

Abandoned mine workings that extend into the saturated strata serve as sinks. However, seepage into the mines is extremely slow. In the western coal reserves area, mine inflows appear to be greatest where extensive retreat mining has produced substantial subsidence.

The total volume of ground water stored in the old mine workings in the eastern coal reserves is unknown, although it is probably substantial. There are few known instances of mine-water discharge from old workings to the surface, but most of the abandoned mine workings in the area have been sealed and water accumulates predominantly in down-dip workings behind the seals. Ground-water inflow to the old mine workings will continue until equilibrium is established between inflow, discharge to the surface, recharge into the subsurface, and the local ground-water table.

Ground-water Usage

Only the alluvial-colluvial aquifer yields sufficient water to serve as a reliable source of water for beneficial use in the CIA. In certain areas the perched ground-water and stored underground mine water systems provide water of sufficient quantity and quality for specific uses such as stock watering. A number of individuals, water user associations, government agencies, and corporate entities hold ground-water rights for alluvial-colluvial wells in area drainages, shallow wells that intercept perched aquifers, and numerous small springs and seeps. Water rights have been filed on mine inflow or stored mine water in four mines in the area.

Actual ground water use within the hydrologic basin is primarily limited to large volume municipal and irrigation use or small volume stock watering applications. The Price River Water Improvement District extracts water for municipal use from ground-water wells located several miles northeast of the CIA, in Sections 23 and 24 of T. 12 S., R. 10 E. Along the Price River valley, especially near Heiner, Martin, and Helper, numerous individuals and corporations have significant water rights that are used for irrigation. Additionally, PacifiCorp owns significant water rights for water from their UGW well located in Section 35 of T. 12 S., R. 9 E.

V. MATERIAL DAMAGE CRITERIA - RELEVANT STANDARDS AGAINST WHICH PREDICTED IMPACTS CAN BE COMPARED.

Standards of quality for waters of the State of Utah are set by the Utah Department of Environmental Quality and the state Division of Water Quality, R317 (Utah Administrative Code). There are also primary (PDW) and secondary (SDW) drinking water standards set by the Division of Drinking Water in Rules for Public Drinking Water Systems, R309 (Utah Administrative Code). The drinking water standards are generally more stringent than the water quality standards when a parameter is listed in both, but many parameters are unique to one set of standards or the other. Standards from both sets of rules were established for Total Dissolved Solids (TDS), total iron, total manganese, and pH. There is a water quality standard for total manganese as it relates to Post-Mining Areas, underground mine drainage after application of best practicable control technology currently available (40CFR Ch.1 Subpart 434.55). There is no drinking water or water quality standard for Total Suspended Solids (TSS).

The level of protection or non-degradation for waters is also determined by the Utah Division of Water Quality. Standards usually vary between classifications. Waters within and adjacent to the permit area are classified as:

- 1C Protected for domestic use with prior treatment
- 2B Protected for secondary contact recreation
- 3A Protected for cold-water species of game fish and other
 cold-water aquatic life
- 3C Protected for non-game fish and other aquatic life
- 4 Protected for agricultural uses

Beaver Creek and its tributaries are classified for 1C, 2B, 3A, and 4 water uses. The Gordon Creek drainage and its tributaries are classified for 2B, 3C, and 4. Identified land uses within the proposed Horizon Mine are wildlife and livestock grazing, recreation, and logging. Areas are not being evaluated for wilderness potential within the CIA. The CIA includes a section of the DNR Wildlife Management Area. Recreational use involves four-wheel driving, camping, and hunting.

The most likely post mining land uses in the CIA for the foreseeable future will continue to be logging, livestock and wildlife grazing, and recreation. The land and waters of the CIA should be maintained or restored to support these uses.

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Upper Gordon Creek

MATERIAL DAMAGE CRITERIA

VI. ESTIMATE OF PROBABLE FUTURE IMPACTS OF MINING ON THE HYDROLOGIC RESOURCES

R729.100 requires the Division to provide an assessment of the probable cumulative hydrologic impacts of the proposed coal mining and reclamation operation and all anticipated coal mining and reclamation operations upon surface- and ground-water systems in the CIA. This CHIA must be sufficient to determine whether the proposed coal mining and reclamation operation has been designed to prevent material damage to the hydrologic balance outside the permit area. The assessment will include consideration for those measures used to minimize impacts in mining operations and will be assessed for risk analysis based on past mining experiences and site-specific information.

Additionally, R728 requires each mine in the CIA to provide a PHC Determination of the following:

- Whether adverse impacts may occur to the hydrologic balance;
- Whether acid and toxic forming materials exist which could result in contamination of surface or ground-water supplies;
- What impacts coal mining and reclamation activities will have on; sediment yield; acidity, total suspended solids, dissolved solids and other important water quality parameters; flooding or streamflow alteration; ground-water and surface-water availability; other characteristics required by the Division;
- Whether the proposed surface mining and reclamation activity will result in contamination diminution or interruption of an underground or surface source of water in the permit or adjacent area.

Adverse Impacts to the Hydrologic Balance

The hydrologic balance is defined under the regulatory requirements R645-100: "Hydrologic Balance" means the relationship between the quality and quantity of water inflow to, water outflow from and water storage in a hydrologic unit such as a drainage basin, aquifer, soil zone, lake, or reservoir. It encompasses the dynamic relationships among precipitation, runoff, evaporation, and changes in ground and surface-water storage.

Potential Changes in Ground-water Quantity

Potential changes in ground-water quantity can result from mining. Table 6 presents a risk assessment of the potential mining related impacts to the hydrologic system. Risk is rated as High (H), Moderate (M), and Low (L). Potential changes and site specific information on the hydrologic system is also discussed.

TABLE 6
GROUND-WATER QUANTITY POTENTIAL IMPACTS

Source	Potential Change in Hydrologic Regime	Mining related factor	Mining related operations used to minimize impacts or, site-specific characteristics affecting the potential for impact.	Evidence of existing and past water quantity changes that may be attributed to mining.	Risk that a mining related factor might occur.	Risk to quantity of a water use
Springs	Dewatered	Subsidence induced fractures propagating through perched aquifers associated with springs.	Most surface springs issue from the upper geologic units of the Blackhawk. Massive Sandstone units exist above the coal to be mined diminishing potential for surface expression. Numerous surface springs are present above previously mined areas.	No diminished flows have been documented by previous mining activities.	M-L	M
		Dewatering fractures associated with springs.	Operations are designed to avoid the major fault system. Numerous smaller fault and fractures are present. A fracture associated with HZ-91-1 will be mined through. No springs were identified as associated with this fault.	Mining through a graben in Gordon Creek #3 and #6 resulted in 400 gpm inflow but no decrease in discharge was documented for any springs.	M	M
		Change in direction of Piezometric surface dewatering springs	A limited number of springs issue from aquifers below the coal. Geologic structure, dip, location and orientation could result in interruption of springs issuing below the mine but they should re-issue following reclamation.	Excess water encountered from mining has not been discharged from portals in previous mined areas. An estimated excess of 50 gpm was predicted may off set flow losses if they occur.	H	M
	Increased Discharge	Sumping or redirecting in-mine water could result in increased recharge to springs within and below the mined sections.	Dewatering of aquifers above the coal may increase recharge to aquifers below mined areas. Interbedded shales may limit vertical movement.	Vegetative changes may be the result of increased flows from Springs in Coal Canyon and may be mining related.	H	L
	Change in location of discharge	Sumping or redirecting in-mine water could result in a change in location of springs	Location of sumps in mine, dip of coal beds and location of fractures in the system may have an affect on where springs are relocated.	New springs issuing from the canyon west of Coal Canyon may be mining induced.	H	L
		Subsidence could cause surface springs to relocate.	Subsidence is not expected to reach the surface.	No known subsidence has changed the location of springs in this area.	L	L

PROBABLE FUTURE IMPACTS

Upper Gordon Creek

TABLE 6
GROUND-WATER QUANTITY POTENTIAL IMPACTS (cont.)

Source	Potential Change in Hydrologic Regime	Mining related factor.	Mining related operations used to minimize impacts or, site-specific characteristics affecting potential for impact.	Evidence of existing and past water quantity changes that may be attributed to mining.	Risk that a mining related factor might occur.	Risk to quantity of a water use.
Aquifers Above Coal	Increased Recharge	Increased recharge may occur due to subsidence above the coal seam.	Increased recharge to aquifers above the coal is unlikely unless fractures heal between aquifers. Clays have been considered to have sealing characteristics between water bearing zones. Overburden between the coal and most surface water is greater than 800 ft.	The old Sweetflls mine may have subsidence fractures near the surface in areas where overburden is shallow. Drill holes indicate zones above mined areas are dry.	H	L
	Increased discharge or, dewatering.	Increases in hydraulic conductivity from caving and fracturing above the mined zone.	Few aquifers have been identified above the coal that are known to issue as a spring or associated with a water right.	Most in- mine waters were stated to come from isolated channel sandstone.	H	M
Aquifers Below Coal	Increased recharge and discharge rates.	Increases in recharge may occur due to location of sumps and due to dewatering aquifers above the mine or, increasing hydraulic conductivity between overlying aquifers. New discharge locations may occur.	Mine operations including location of sumps, and mine water discharge rates may affect the rate of recharge to aquifers below the coal. Following reclamation increased recharge may occur from intercepting aquifer waters above the coal. The aquifers below the coal are separated by clay and shale layers that may impede flow to lower aquifers.	An increase in discharge may have occurred in the Storrs Sandstone of the Star Point aquifer. New seeps are present in a canyon west of Coal Canyon below the mined zone.	H	L-M
Mined Coal Zone	Change in Hydraulic Conductivity.	Due to the removal of coal and subsidence above the coal the hydraulic conductivity will be changed.	The amount of coal removed will dictate total influence.	No related information has been presented from previous mining in the CIA.	H	M

Evaporative Losses

Presently the mines at Gordon Creek #2, #7 and #8, are under reclamation and all mine associated openings are presently sealed. The proposed mine ventilation in the Horizon Mine is expected to evaporate an average of 6 gpm (10 acre-ft/year) from air circulating through the mine.

Mine Water Discharge

Mine water was produced and has been discharged from the Gordon Creek #3 Mine and most recently the Horizon Mine. The Gordon Creek #2, #7 and #8 Mines did not produce enough mine water to be discharged.

The portals of the Beaver Creek Coal Company Gordon Creek #3 Mine were located in Coal Canyon, and initial mine development was within the Fish Creek Graben (Figure 3; Figure 6-2 of the Horizon MRP). Mining proceeded to the south and west until stopped by a 40-ft fault at the edge of the Fish Creek Graben. Mining to the north, the working crossed the fault zone at the northeast side of the graben, where offsets were on the order of 12 to 14 ft. The mine had been dry before reaching this faulted area, but then water began to flow through the mine floor at approximately 400 gpm as the workings were advanced; during retreat mining this area was dry. The fault intersects the creek in Coal Canyon at about 7400 ft level.

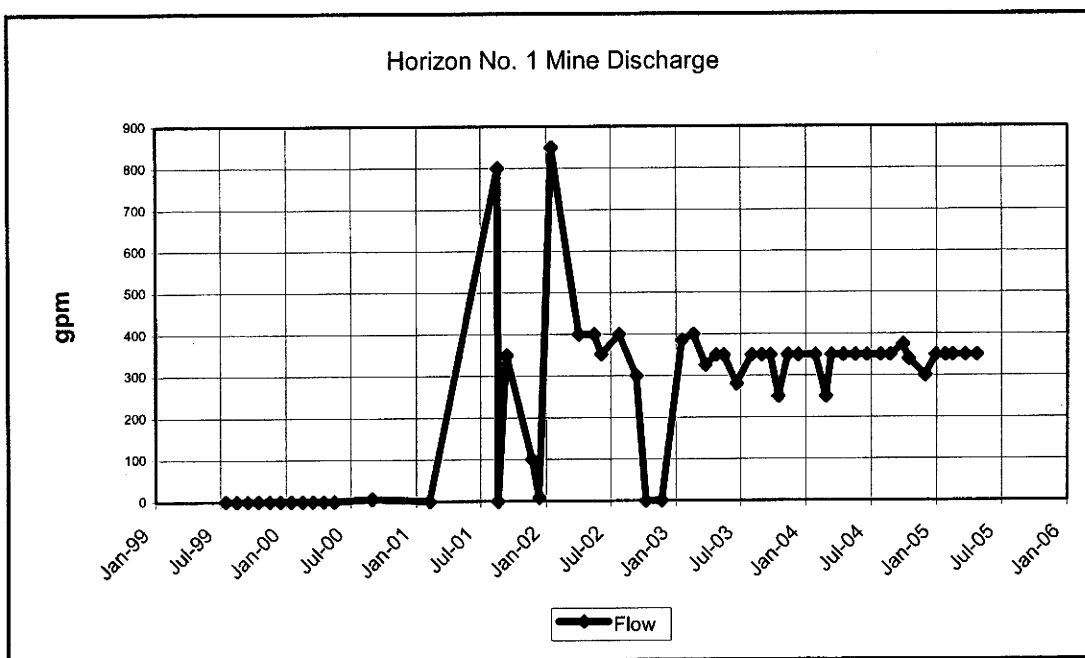
The original intent was to avoid this fault in the Horizon No. 1 Mine. Soon after mining began, it became evident that more water was entering the mine than was expected from dewatering of the Blackhawk Formation. It was concluded that the old workings had intercepted a fault, not the bounding fault of the graben but probably one tied into it somewhere near where the Gordon Creek #3 mine crossed out of the graben and encountered similar inflow. This fault was conveying a large volume of water into the mine. As the Horizon No. 1 North Mains and adjacent panels were advanced in 2000 – 2002, they encountered the same water-bearing fault. It initially produced 450 gpm, but inflow dropped to 200 to 300 gpm within two months. When mining ceased in 2002, water continued to be pumped from the mine at 294 gpm, and in 2003 this dropped to 269. When mining resumed in August 2003, an estimated 30 gpm flowed from the working face, so the pumping volume increased. Approximately 100 ft back from the face the entries do not produce water.

Mine water is currently being discharged from the Horizon No. 1 Mine. The rate of discharge has been fairly constant at 350 gpm since May 2003 (Chart 1). The mine has reached a level that Hidden Splendor Resources thinks matches the hydrostatic head in the upper member of the Star Point Sandstone.

Plans for the Horizon No. 1 Mine project the water-bearing fault will be encountered in the future. The expected maximum inflow from the fault when it is breached is on the order of 400 to 500 gpm. Combined with inflow from dewatering the surrounding strata, estimated using Lines (1985) method, the maximum inflow would be approximately 500 to 600 gpm for a short period of time but average more like 200 to 300 gpm.

When mine water is discharged from the Gordon Creek #3 Mine and Horizon No. 1 Mine, it is discharged to the sedimentation ponds until water quality tests show it meets the standards to discharge it into the stream under a UPDES permit.

Based on a review of mine records, Roger Skaggs (a principal in the Blue Blaze Coal Company and an employee of the Beaver Creek Coal Company, personal communication to Hidden Splendor Resources, Inc. and cited in the Horizon Mine MRP) is of the opinion that many faults have been mined through in the Hiawatha seam in the mines adjacent to the Horizon No. 1 Mine with only insignificant or minor amounts of water encountered,

Chart 1 – Discharge from the Horizon No. 1 Mine**Change in the Potentiometric Surface**

There is insufficient information from early mining operations to determine the pre-mining elevations of the potentiometric surfaces for aquifers within, above, and below the coal seams. Mining activity has occurred in the Castle Gate A and Hiawatha Seams, which may have dewatered previously existing aquifers. No monitoring well data exist from these previous mining activities. Exploratory holes LMC-1, LMC-3, and LMC-4, drilled within the permit boundary in the late 1976 and 1980, were retained as open holes to measure water levels, but they were plugged-back to elevations above well above the coal seams. They were reported dry at total depth in the coal seams at the time they were drilled and dry at all subsequent measurements at the plugged-back depths.

Exploration drill holes BC-1 and BC-2 are located very near the Beaver Creek channel, just north of the permit area. Beaver Creek Coal Company drilled them in the late 1970s. Both have artesian flow. BC-1 was spudded in the top of the Blackhawk Formation and BC-2 was spudded approximately 60 to 80 ft above the Castlegate - Blackhawk contact. These wells are assumed to produce water from approximately 80 to 100 ft below ground surface, suggesting that water is contained in some of the upper sandstone units of the Blackhawk Formation, although faults may be the source of this water.

In October 1995, Horizon Coal Company completed four additional monitoring wells. HZ-95-1-S was completed in a saturated zone in the Blackhawk Formation but above the coals, at 205 to 210 foot depth. HZ-95-1, HZ-95-2, and HZ-95-3 were completed in the Spring Canyon Sandstone. A fifth piezometer, HZ-01-06-1, was completed in November 2001 near the northern

boundary of the Horizon Mine permit area; it was also completed in the Spring Canyon Sandstone. HZ-95-1 will be intercepted by the planned mining, and HZ-95-3 and HZ-01-06-1 may be impacted by subsidence. HZ-95-2 is outside the Fish Creek Graben and outside the proposed mining area.

Water levels in these piezometers have been measured during the first, second, third, and fourth quarters, the sites usually being inaccessible November through February (Chart 2). Results are tabulated in Table 7-1 in the Annual Reports and in the Division's database. Figures 7-2, -2A, and -2B of the Horizon MRP represent the potentiometric surface as it was in December 1995, September 1996, and June 2002.

Table 7 – Information on Piezometers in the CIA

Name	Location	Date	Surface (Top of Casing)	Depth	Screened Interval	Stratum
BC-1 (artesian)	T. 13 S, R. 8 E, SWSE Sec 5	1970s		80-100	?	Upper Blackhawk
BC-1 (artesian)	T. 13 S, R. 8 E, NWNW Sec 4	1970s		80-100	?	Upper Blackhawk
HZ-95-1S	T. 13 S, R. 8 E, NWSW8 Sec 8	October 1995	8352.6 (8356.5)	220	205-215	Blackhawk
HZ-95-1	T. 13 S, R. 8 E, NWSW8 Sec 8	October 1995	8352.6 (8356.7)	1080	1065-1075	Spring Canyon Member
HX-91-2	T. 13 S, R. 8 E, NWSW8 Sec 8	October 1995	8346.3 (8347.6)	1200	1185-1195	Spring Canyon Member
HZ-93-3	T. 13 S, R. 8 E, NWSW8 Sec 8	October 1995	7897.6 (7901.5)	470	455-465	Spring Canyon Member
HZ-01-06-1	T. 13 S, R. 8 E, NWSW8 Sec 8	November 2001	(8761.4)		Bottom 60 ft	Spring Canyon Member

HZ-95-1 was sampled for water quality eight days prior to the December 1995 water-level measurement. In an attempt to purge the well and obtain a representative water sample, the well had been pumped periodically over a period of approximately 3 weeks. The well pumped dry after only 1 to 10 gallons of water were removed, and recovery took several days, recharging very slowly. This pumping and recovery cycle was repeated several times. Water levels perhaps had not fully recovered from pumping when the water level was measured in December 1995.

The December 1995 water-level data show that the Spring Canyon Tongue had a hydraulic gradient of 0.014 in an east-southeast direction (Figure 7-2 of the Horizon MRP). The

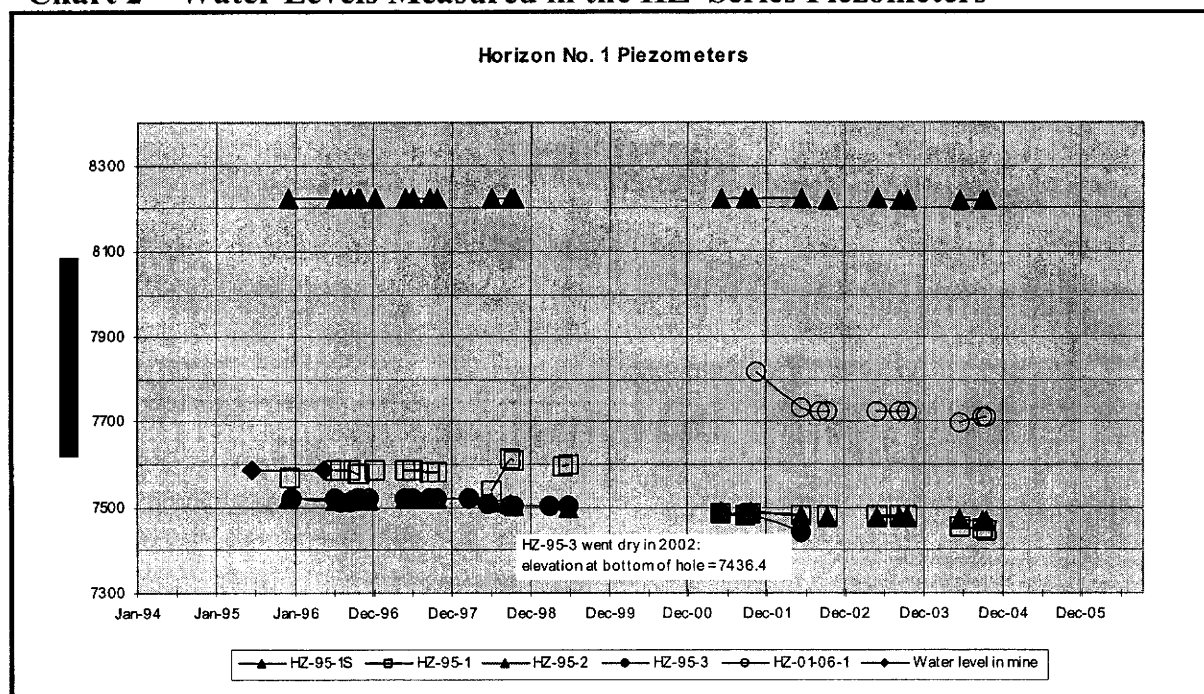
PROBABLE FUTURE IMPACTS

Upper Gordon Creek

overlay of the potentiometric surface and elevation of the Spring Canyon Tongue was used by Horizon to estimate the saturated portion of the coal formation. Data obtained in July through September 1996 indicate the surface-water elevation had remained relatively steady in Well HZ-95-2, but water elevations decreased by approximately five ft at well HZ-95-3 and increased by seventeen ft at HZ-95-1. The September 1996 data indicate that the potentiometric surface had a gradient of 0.019 ft/ft and the general direction of flow was a little more southerly than the December 1995 data indicated (Figure 7-2a of the Horizon MRP). The November 2002 map (Figure 7-2b of the Horizon MRP) indicates further shift of the gradient towards the south, with large drops in water levels in the three older piezometers. This probably results from dewatering of the Star Point Sandstone by the mine.

The potentiometric surface at HZ-01-06-1 dropped 85 ft between the first and second readings. It is unclear whether the drop was due to the mine de-watering the aquifer or if the initial reading was inaccurate: during drilling, circulation was lost numerous times resulting in drilling fluid flowing into the formation, and drilling fluid reentering the bore hole may have artificially elevated the potentiometric surface for the first reading. However, HZ-95-1 experienced a 104-ft drop over a similar time period between the fall of 1999 and spring of 2000. Due to this relatively rapid drop in the potentiometric surface and the magnitude of the drop at HZ-95-1 it can be concluded that the influence of water-bearing fault extends at least as far north as Beaver Creek, where HX-95-1 is located. If the initial water level reading for HZ-01-06-1 is valid then it can be concluded that the influence of the water-bearing fault on the potentiometric surface extends at least to the northern permit boundary.

Chart 2 – Water Levels Measured in the HZ Series Piezometers



Most springs in the CIA issue above the mapped and projected potentiometric surface of the Star Point. This indicates that fractures typically do not connect the Star Point Sandstone with these shallow systems. Due to low hydraulic conductivity of the lower formations, water is retained and discharged in shallow systems, at times through springs associated with near-surface fractures.

Horizon piezometers HZ-95-1, HZ-95-2, HZ-95-3, and HZ-01-06-1 were completed in only the top member of the Star Point Sandstone. The Star Point intertongues with and sits over shale members, effectively blocking vertical flow below the sandstones. However, water has issued from fractures in strata below the top of the Star Point.

Inter-mingling of Aquifer Waters

Intermingling of aquifer waters could occur if subsidence-induced fracturing were to increase localized porosity across aquifers. Subsidence might occur where full extraction mining is planned. In most areas, the overburden is greater than 600 ft, sufficient to minimize fracturing on the surface. Subsidence impacts are not as catastrophic with room and pillar mining (planned by Horizon Mine) as seen when using longwall equipment.

Surface-water Quantity

Surface-water quantity may be affected by changes to the ground-water system. The interaction of these systems and the geologic system may influence quantity of surface-water flows. Table 8 presents a risk assessment of the potential for a mining related factor to affect the hydrologic system and the potential that a quantity of use may be affected by these changes. Risk is rated as High (H), Moderate (M), and Low (L). Additional potential changes or site specific information on the hydrologic system is also discussed below.

TABLE 8
SURFACE-WATER QUANTITY POTENTIAL IMPACTS

Stream	Potential Change in Hydrologic Regime	Mining related factor.	Mining related operations used to minimize impacts, or site-specific characteristics affecting potential for impact.	Evidence of existing mining characteristic	Risk that a mining related factor might occur.	Risk to quantity of a water use.
Jewkes Creek	Loss of stream flow	Subsidence induced fractures propagating to the surface.	The mine operations are set up to avoid mining under this stream. And a stream buffer zone has been designated.	This stream has not been mined under in the past.	H	L
		Interception of water from fractures and aquifers that deplete baseflows.	Mine operations were set up to avoid mining into the fracture associated with this stream. Much of the water originates from springs outside the area proposed to be mined.	No changes in streamflow have been noted on Jewkes Creek related to mining the area.	M-L	L

PROBABLE FUTURE IMPACTS**Upper Gordon Creek**

Stream	Potential Change in Hydrologic Regime	Mining related factor.	Mining related operations used to minimize impacts, or site-specific characteristics affecting potential for impact.	Evidence of existing mining characteristic	Risk that a mining related factor might occur.	Risk to quantity of a water use.
	Increases in streamflow.	Increases in streamflow could occur from mine water discharges, increased hydraulic conductivity between aquifers above the coal and, transbasin diversions.	Mine operations can be set up to control discharge rates. Significant aquifers directly above the coal seam have not been identified.	No changes in streamflow have been documented on Jewkes Creek related to previously mining the area.	M	M
	Seasonal Changes	Mine water discharge could potentially increase summer season baseflow. Following reclamation, increased conductivity may seasonally increase or decrease discharge based on retention time of the system.	Operations can control sumping locations and thereby control mine discharge rates during mining. Although discharging may be desirable. Clay swelling and settling of overburden over time may decrease the hydraulic conductivity of the system following mining.	Excess of in-mine water is predicted to be discharge at a rate of 50 gpm. Because most discharge from Jewkes creek is from springs not expected to be impacted, changes following reclamation are not expected.	H	M
Beaver Creek	Loss of stream flow	Subsidence induced fractures propagating to the surface.	With an overburden of approximately 1000 ft and a coal thickness of 7.5 ft there is little potential for subsidence cracks to propagate to the surface. Any fracturing that does occur in the stream channel is likely to fill rapidly as a result of sedimentation. With cover greater than 800 ft, panels oriented perpendicular to the stream, and full extraction of the coal, some short-term effects can be expected, but the stream is expected to revert to a pre-mining configuration.	Previous mining has occurred under Beaver Creek without documented losses.	H	L
		In the event that a sharp subsidence induced drop occurs at the fault, with headcutting at upstream fault crossing, ponding and downcutting at downstream fault crossing, or loss of streamflow into fractures.	Reconstruct the impacted section of the channel to be erosionally stable so as to prevent erosion and loss of topsoil. If stream flow is lost into the fault, excavate and backfill the scarp fracture with clay prior to reconstructing the channel. If subsidence fractures occur without vertical displacement and flow is lost into the fracture, seal the fracture with a mixture of soil and bentonite.	Previous mining has occurred under Beaver Creek without documented movement along the graben faults.	M	L

PROBABLE FUTURE IMPACTS

Stream	Potential Change in Hydrologic Regime	Mining related factor.	Mining related operations used to minimize impacts, or site-specific characteristics affecting potential for impact.	Evidence of existing mining characteristic	Risk that a mining related factor might occur.	Risk to quantity of a water use.
	Decreased Baseflows	Decreased base flow could occur if springs are dewatered or if streams in connection with fractures are dewatered during mining, or if subsidence propagates fractures to the surface increasing losses.	Massive sandstone units are believed to be important in reducing propagation of fractures to the surface. Clays are believed to swell shut and reduce flow potential in fractures. Where fractures may be dewatered, stream losses would be related to the rate of flow through the alluvium to the fracture.	Previous mining has occurred under Beaver Creek without documented losses in baseflow although this is a limited database.	M	M
	Trans Basin Diversions	Could occur through intercepting surface waters and springs in Beaver Creek that are discharged into the Gordon Creek Basin.	Interception of springs and surface waters in the Beaver Creek drainage is not expected. Increased porosity and dewatering of fractures may increase vertical migration of water and result in losses from the Beaver Creek drainage to Gordon Creek.	No springs or surface waters have been documented to be intercepted through past mining practices, although the database is limited.	M	M
North Fork Gordon Creek	Decrease in Streamflow	Reduced flows from dewatering fractures and aquifers depleting surface flows.	Relative location downstream of mine operations may result in temporary losses during mining operations and should recharge following reclamation. Mine water discharge may result in no net change if mining intercepts these waters.	No noted decreases have been identified in past operations although database is limited.	L	L
	Increase in Streamflow	Increases could occur from transbasin diversions. Dewatering perched aquifers and fractures.	The lower stream segment is below the base of the Hiawatha and may receive increased base flow if increased recharged occurs from mining activities.	Mine water discharge has not occurred in previous mining activities but is predicted to occur. Increased discharges from springs along Coal Canyon have been noted.	M	M
	Seasonal Changes	Seasonal changes could occur due to increased hydraulic conductivity reducing residence time in the aquifers.	The equilibrium the system reaches following mining will determine whether seasonal changes may occur. Because the existing system is highly fractured, increased conductivity may not significantly affect seasonal flows.	Seasonal changes have not been noted from past mining although the database is limited.	M	L

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Presence of Acid- or Toxic-Forming Materials

Tests for Acid and Toxic forming materials were conducted on roof and floor samples in LMC-4 and HZ drill holes. Results of the chemical analyses in Table 6-5 of the MRP summarize the acid and toxic nature of the Hiawatha Coal Seam in the CIA. The acid base potential of each of the three coal samples collected from the HZ-series holes indicate that the coal has a potential to be acid-forming, with values from -9.1 to -15.8 tons CaCO_3 per 1000 tons of material. Coal sample analyses show total sulfur contents from 0.38 % to 0.61 %, of which 0.02 % to 0.07% is pyritic sulfur. Overburden and underburden have a high neutralization potential (20.3 to 64.0 tons of CaCO_3 per 1000 tons), although one roof sample from LMC-4 contained 0.24 percent pyritic sulfur.

Water Quality Impacts

Changes in ground-water quality may occur through contamination from acid- or toxic-forming materials and hydrocarbons, chemicals, or other materials associated with mining activities. Changes in surface-water quality may occur due to contamination from: acid- or toxic-forming materials; hydrocarbons, chemicals, or other materials such as rock dust associated with mining activities; increased sediment yield from disturbed areas; flooding; or streamflow alteration.

Increased Sediment Yield from Disturbed Areas.

Sediment yield is one of the major problems identified for any construction or development project. Exposed soils are susceptible to erosion. Developing mines and operating mining equipment at mine sites exposes soils to the elements, creating dust and mud that can be washed off site. Under SMCRA, mining operations are required use sediment control structures to divert undisturbed flows away from the disturbed areas, control disturbed area runoff, and capture sediments to prevent them from leaving the disturbed area of the minesite.

Mining activities in the CIA have a potential of contributing sediment to Jewkes Creek and the North Fork of Gordon Creek. Recent logging activities caused a large amount of sediment to flow onto the permit area. With the end of logging, this impact has continued but at decreased rates.

The Gordon Creek #2, #7, and #8 Mines are under reclamation. Some contributions of sediment may be expected from this area until the vegetation is adequately established at the site. Presently most disturbed area sediment reports to sedimentation ponds on site. One small area does not report to the pond and has proposed alternate sediment control measures. The Gordon Creek #3, and #6 Mines have met all requirements for reclamation, including a 10-year bond period, and have received bond release. The permitted land has been returned to pre-mining conditions and turned back to the landowner.

Acidity

Acid forming discharges are uncommon in the region and acid forming materials are not known to be extensive in Utah coal mines. Past mining practices have probably increased alkalinity rather than increased acidity. Coal will be in contact with air and water during the

mining operations, including coal left underground, which could potentially lower the pH in those waters. Currently, water from the old Blue Blaze No.1 mine workings has a pH of 6.8 to 7.66. In general, these are lower than pH values in the surrounding area, but do not fall into a range where the pH would affect use of the water.

Coal will be stored on the surface for short periods at the Horizon Mine. Runoff from the coal stockpile will be routed through the sedimentation pond where it will mix with more alkaline runoff from the mine pad should pyrite in the coal cause pH to decrease locally, downstream mixing with higher pH waters would minimize or eliminate off-permit impacts.

Storage of coal in the mine yard will be short-term. All runoff from the mine yard reports to the sediment pond. Coal fines that are washed from the stockpile will be stopped at the sediment pond and will be subject to the same testing, treatment, and disposal as the rest of the sediment. If precipitation produces acidic runoff from the coal stockpiles, it will tend to be neutralized by the alkaline nature of the mine yard substrate.

Total Suspended Solids

A probable consequence of surface disturbance is increased sediment loading and increased total suspended solids (TSS) in runoff from the disturbed area. All runoff from the Horizon mine yard reports to the sediment pond, which is constructed to contain runoff from the 10-year, 24-hour storm event. The UPDES permit for this pond allows a maximum 70 mg/L TSS daily, 25 mg/L for a 30-day average. The Division's database shows this pond has discharged twice since 1996, and UPDES limitations were met.

Total Dissolved Solids

Contact between disturbed area runoff and materials exposed to weathering and oxidation, drainage from coal refuse and mine waste storage areas, and discharge of excess mine drainage may result in increased TDS and an increase in individual constituents. Potential increases may be effectively addressed on a short-term basis by establishment of the drainage and sediment control system and through compliance with discharge effluent limitations of the UPDES permit. The present permit limitations for TDS discharged from all mine water and decant operations is limited to 1 ton per day to Jewkes Creek.

Other Materials Associated with Mining

The road to the mine is maintained as a gravel road; therefore, the use of road salting is not likely to affect water quality. However, the county has requested magnesium chloride as a road dust suppressant, which may increase the magnesium present in the system. No longwall mining is proposed so spills from longwall mining fluid are not expected. If calcium sulfate were to be used as rock dust, an increase of sulfates could occur in the surface waters or waters discharged by springs below the mine, but this is not expected to occur. Calcium carbonate is to be used for rock dust in the Horizon Mine, so the general signature of the calcium bicarbonate type water should not change.

Hydrocarbon Contamination

Diesel fuel, oils, greases, and hydrocarbon products will be stored above ground and may be spilled in the mine and on the surface during mining operations. Proposed concrete containment structures and Spill Prevention and Contamination Control Plan will minimize the potential for impacts.

Flooding or Stream Flow Alteration

The potential for flooding within the disturbed area and downstream is diminished by using the sedimentation pond to attenuate peak flows. Upstream drainages are transported underneath the Horizon pad through bypass culverts designed to safely pass the peak flow from a 100-year, 6-hour event.. It is likely that the water flowing through the culvert will have increased flow velocity over the natural velocities for the same discharge rates, so operational designs include a discharge pool downstream of the sedimentation pond and riprap at the culvert outlet to prevent streamflow alteration. The reclamation of Portal Canyon will return the ephemeral flows from this canyon directly to Jewkes Creek. The reclamation channel will be designed to encourage development of riparian vegetation in Jewkes Creek. Other potentials for streamflow alteration include an increased discharge through the operation period due to mine dewatering. This flow may promote downstream vegetative growth that may encourage stability during the operating phase.

Past mining has caused a reduction in streamflow. The Sweets mine is suspected to be intercepting surface waters in Bryner Canyon at the #2, #7 and #8 mine. It is not known where this flow re-issues but it is suspected that it may re-issue in Sweets Canyon. This reduction has not been determined to have resulted in contamination, diminution, or interruption of a water supply.

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June 7, 2005

Upper Gordon Creek

PROBABLE FUTURE IMPACTS

VII. MATERIAL DAMAGE DETERMINATION

The material damage determination is based on the past, present, and expected mining and the associated changes that may be expected to occur to the water resources from mining operations. These changes constitute material damage if the change causes the loss of a legitimate use in quantity or quality. Replacement or mitigation for a legitimate use may result in no net loss of the legitimate use. Criteria that are used to determine material damage to hydrologic resources in coal mining programs administered by other states or by the Federal Office of Surface Mining (OSM) include:

- Actual or potential violation of water quality criteria established by federal, state, or local jurisdictions.
- Changes to the hydrologic balance that would significantly affect actual or potential uses as designated by the regulatory authority.
- Reduction, loss, impairment, or preclusion of the utility of the resource to an existing or potential water user.
- Short term (completion of reclamation and bond release) impairment of actual water uses that cannot be mitigated.
- Significant actual or potential degradation of quantity or quality of surface water or important aquifers.

Each factor addressed in the Probable Hydrologic Impacts that may affect a water use will be discussed to indicate whether material damage is expected to occur to a legitimate water use. The reasons for the determination of potential for risk to a water use is discussed further.

Adverse Impacts to the Hydrologic Balance:

Ground-water Regime

Although fracturing and faulting is abundant in the CIA, mining of areas adjacent to a water-bearing fault have been indicated to be dry. Mining through water-bearing faults near the Gordon Creek #2 mine has not resulted in any documented loss or dewatering of springs in the CIA. One fracture associated with well HZ-95-1 will be undermined but no documented springs are associated with that fracture. A change in the piezometric surface may dewater springs issuing from the Star Point in Coal Canyon and the canyon west of Coal Canyon; however, it is not known whether these springs are in hydrologic connection with the area to be mined. If the spring water were in connection with the mine, the water pumped from the mine probably would offset the losses from the springs. Due to the location and elevation of the fractures relative to mining, it is likely that water would re-issue from the springs when the potentiometric surface recovers following mining. Therefore, no material damage is expected to occur to the quantity of downstream water use.

Increased Discharge in Springs

Increases in discharge of springs below the coal to be mined is possible following mining but is less likely to occur during mining. Dewatering of water-bearing zones that do not issue to surface springs or increased hydraulic connection to aquifers above the coal may increase discharge. Increased discharges may have occurred along a fracture in Coal Canyon as evidenced by a vegetative change to wetland species in the discharge area. Increased discharges have not been demonstrated to adversely affect quantity of legitimate water uses. (Increased ground-water recharge and discharge are considered to have similar results).

Change in Location of Spring Discharge

Changes in location of discharge might occur at low points of fractures and below the mined area. Currently new springs have issued in a drainage west of Coal Canyon. It is probable that these springs are discharging from a flooded, mined-out, area.

Changes in spring locations may also occur due to subsidence. The perched aquifers of the Blackhawk Formation are lenticular and localized; the stratigraphic sequence has overall low permeability. If fractures reach the surface the springs may be readjusted and discharge at another surface location. Past experience presented no documented cases of relocation of springs due to subsidence. Because the Blue Blaze #3 Mine has already mined above much of the area where the Horizon Mine workings will be, it is expected that subsidence is not likely to cause material damage.

Increased Ground-water Recharge

Propagation of subsidence to the surface could result in increased recharge. Increased recharge to the Sweets Mine has probably occurred through surface-water interception along Bryner Canyon. This area has been mined with little overburden. The proposed Horizon mining operations have a greater depth of cover, and mining of the Castle Gate A and Hiawatha Seams with similar overburden has not resulted in any documented cases of subsidence fractures. Increases in recharge to the aquifers above the coal is not likely because those aquifers influenced will probably drain to the mined area. Increases in recharge of aquifers within and below the coal is likely, but has not adversely effected the quantity of the proposed use.

Changes in Hydraulic Conductivity

Changes in hydraulic conductivity may change the timing and rates of discharge to springs and surface waters. With an increase in hydraulic conductivity, the high-flow periods could potentially flow at greater rates, leaving less water available for low-flow rates. Because the stratigraphic sequence has a low overall permeability and is interbedded with clays it is expected that any increase in hydraulic conductivity above the coal would eventually decrease over time. The hydraulic conductivity of the mined areas of the coal seams will change. These zones will fill with water and the head will come into equilibrium with the rate of recharge. Because no significant baseflow contributions from the coal seams have been identified, it is not expected to have an impact on the surface water in the area following mining and establishment of a new equilibrium with the ground-water system.

MATERIAL DAMAGE DETERMINATION

Upper Gordon Creek

Surface-water Regime

Jewkes Creek may see increased flows during the period of mining operations due to mine dewatering. The predicted inflows and predicted use suggest this value will change by approximately 50 gpm. The sumping operations and use and consumption of water in the mine will dictate the rate of discharge. In most mining operations this has increased water availability during low flow. Thus, no impacts to quantity for a legitimate water use have resulted during operations. Following operations the discharge rates will occur in equilibrium with the system. No losses of quantity of use have been documented for the areas that have previously been mined. Therefore, it is expected no material damage will occur in the future.

Beaver Creek is located above the area to be mined by the Horizon Mine. Approximately one mile of the Beaver Creek stream channel was previously undermined by mining in the Bastleate A Seam at the Consumers #3 Gordon Creek #2 Mines. Limited data are available, but no loss of flow over time has been documented; however, a citizen's complaint has indicated that mining has decreased flows in the stream. The first year of monitoring is established to further assess this potential. The fact that the stream is presently flowing indicates this activity probably will not completely deplete surface flows in Beaver Creek. However, increased vertical flow rates could reduce surface flow and would be controlled by the hydraulic conductivity of the alluvium and lower water bearing zones. The rate of increased discharge, if any, would be controlled by the system and could not be predicted.

The North Fork of Gordon Creek has been monitored below the Gordon Creek #2, #7 and #8 Mine. The Sweets mine is suspected to be intercepting surface waters in Bryner Canyon at the Gordon Creek #2, #7 and #8 Mine. It is not known where this flow re-issues but it is suspected that it may re-issue in Sweets Canyon. The water in the North Fork of Gordon Creek has not been determined to result in contamination, diminution, or interruption of a water supply; therefore, no material damage has been identified. Future mining may change the location of discharge to the stream but is not expected to cause material damage.

Surface-water Quality

Water quality outside the permit boundary is expected to be the same as presently observed. One reason for this assessment is the large extent to which mining has occurred in the past without producing known impacts to the water quality; however, historical baseline information is not available because mining occurred in this area prior to the enactment of SMCRA, therefore, the changes that may have occurred due to mining cannot fully be assessed. No material damage to quality or loss of use has occurred in this area and is not expected to occur.

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June 13, 2005

Upper Gordon Creek

MATERIAL DAMAGE DETERMINATION

VIII. STATEMENT OF FINDINGS

Mining in the federal lease north of Beaver Creek will likely intersect faults and undermine Beaver Creek as well as some springs. Development of the Horizon Mine will include monitoring adequate to identify impacts to the hydrologic balance and contamination, diminution, or interruption of water supplies. Available information indicates that impacts to the hydrologic balance from past mining have been minimal and that there is a very low probability that any streams or springs will be affected during this permit term as a result of mine subsidence. Evaluation of the data and information received from Hidden Splendor Resources, Inc. as well as analyses of germane studies and reports from other sources leads the Division to find that no material damage will occur to the hydrologic balance outside the permit area as a result of mining the federal lease.

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June 13, 2005

Upper Gordon Creek

STATEMENT OF FINDINGS

APPENDIX A

Figure 1	Cumulative Impact Area
Figure 2	Location Map
Figure 3	Geologic Map
Figure 4	Mine Map – Castlegate A Seam
Figure 5	Mine Map – Hiawatha Seam (Wattis)
Figure 6	Hydrologic Map
Figure 7	Watershed Boundary Map

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Upper Gordon Creek

APPENDIX A

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June 7, 2005

Upper Gordon Creek

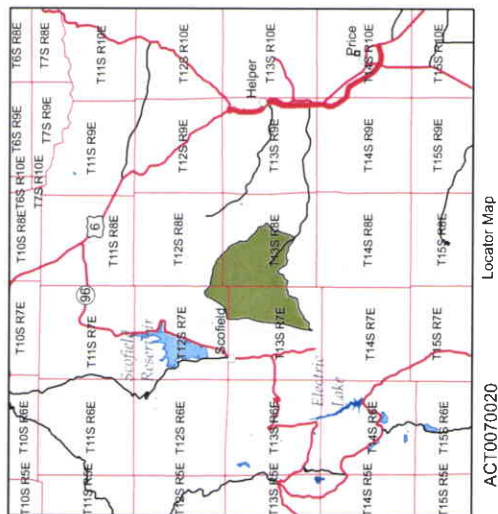
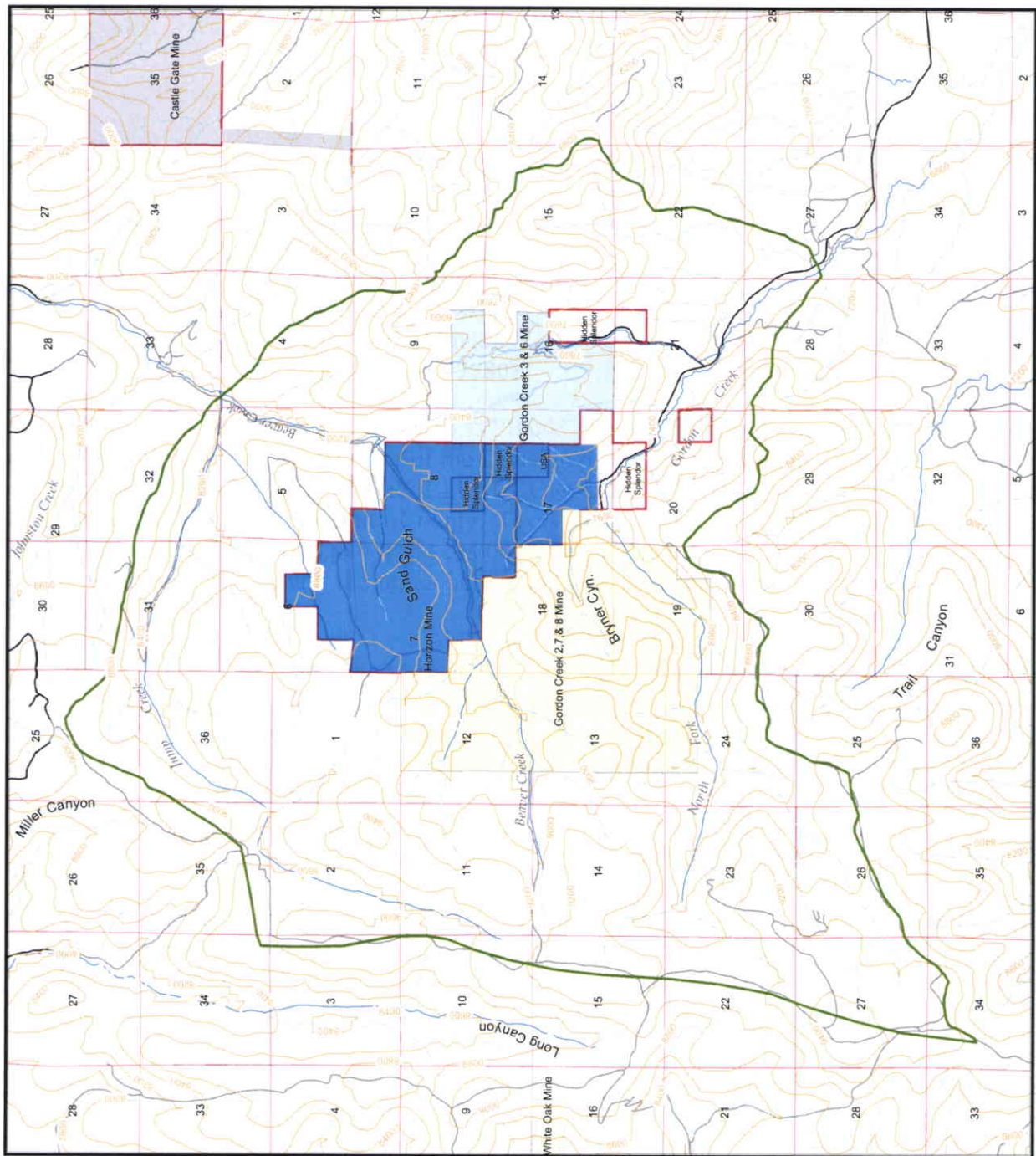
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Western Regional Climate Center (WRCC), <http://www.wrcc.dri.edu>

O:\CHIA\CHIAS\UpperGordonCreekAndBeaverCreekBasin\Final\06132005\06132005.doc



- CIA Area
- Stream and braided streams, river banks
- Wash or ephemeral drain
- Intermittent streams/Braided stream (subset of above)
- Topographic contour
- Lease Boundary
- Main Road
- Graded Road
- Dirt Road

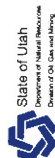
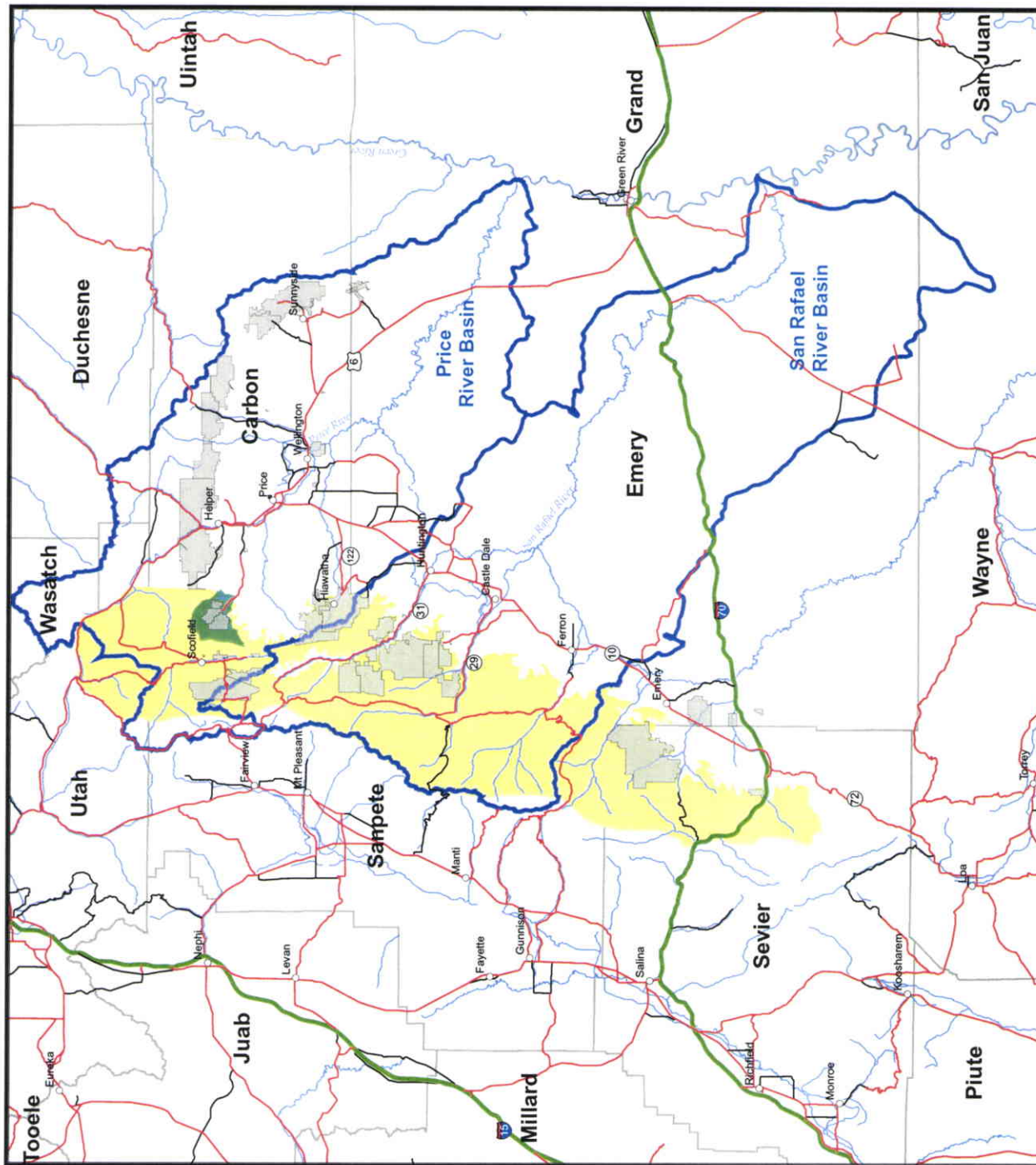


Figure 1
Cumulative Hydrologic Impact Assessment
Horizon Mine
CUMULATIVE IMPACT AREA (CIA)
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Compiled by AM Date: May 26, 2005



ACT0070020

Locator Map



State of Utah
Department of Natural Resources
Division of Oil, Gas, and Mining

Figure 2
Cumulative Hydrologic Impact Assessment
Horizon Mine
LOCATION MAP
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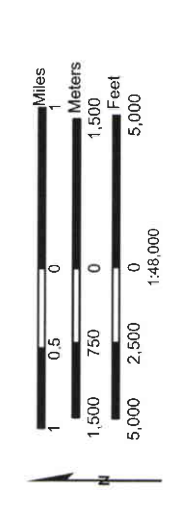
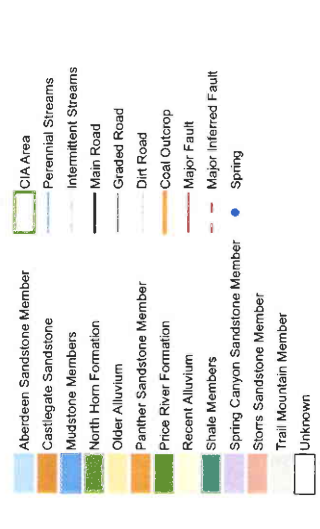
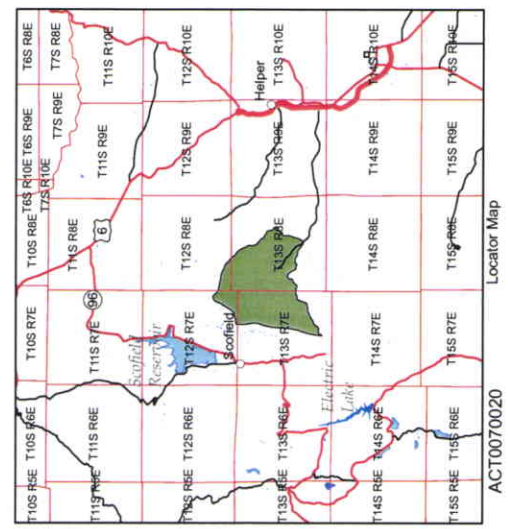
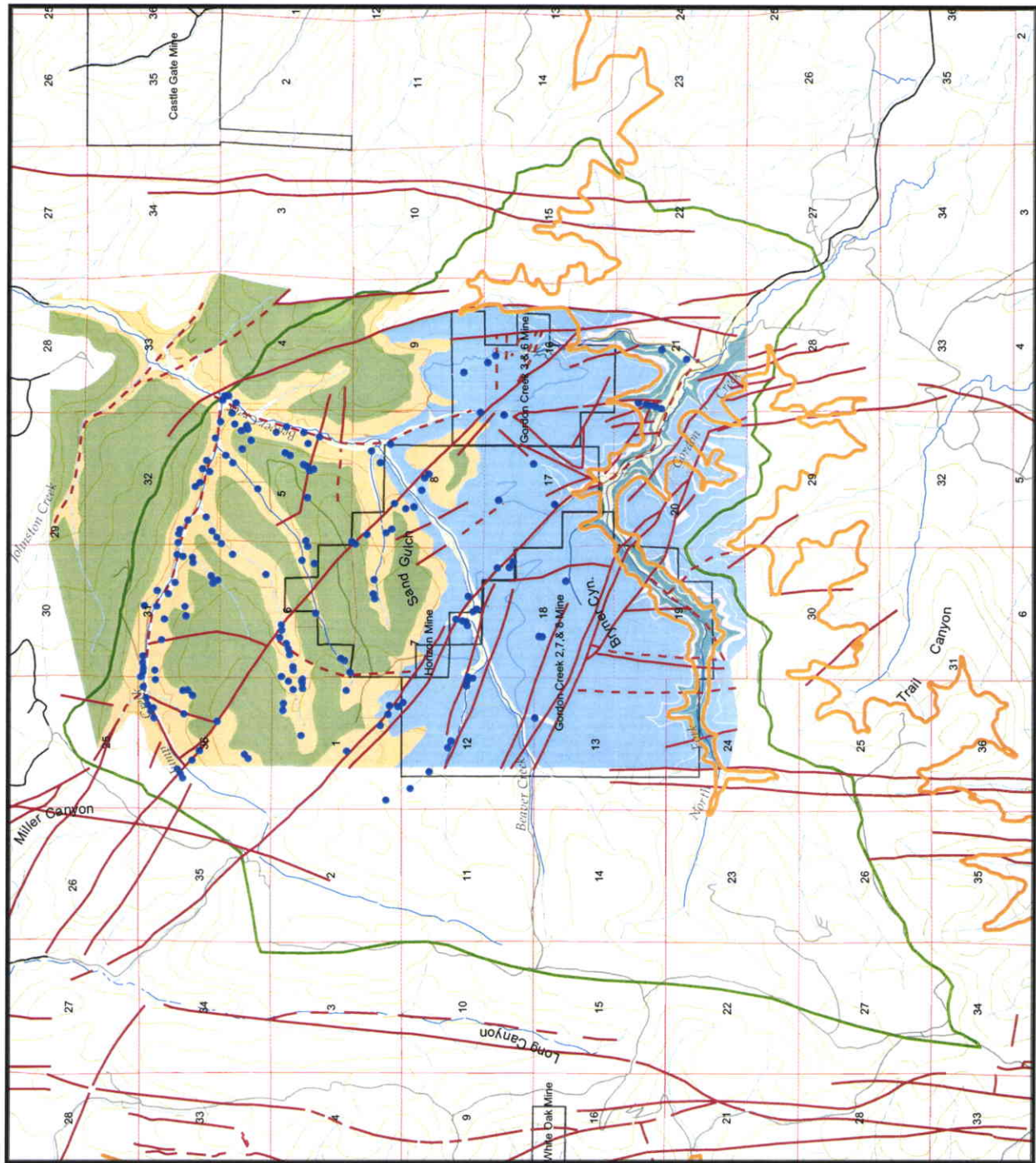
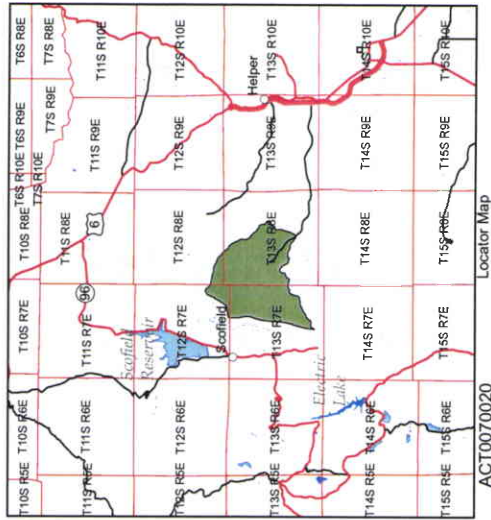
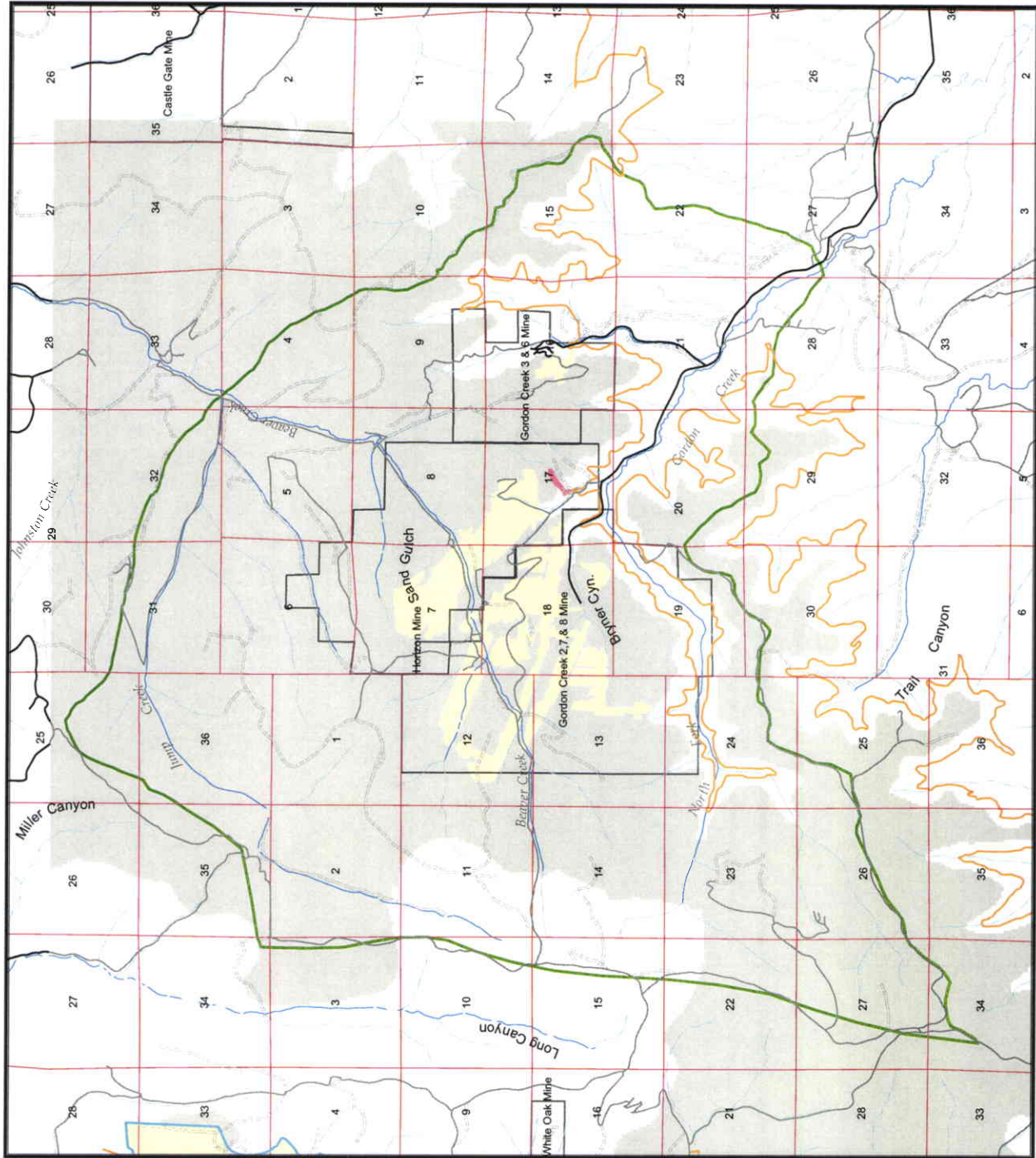


Figure 3
Cumulative Hydrologic Impact Assessment
Horizon Mine
GEOLOGIC MAP
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 Compiled by AM Date: May 26, 2005



- Castlegate A Seam
- Mined Area
- Disturbed Area
- CIA Area
- Perennial Streams
- Intermittent Streams
- Main Road
- Graded Road
- Dirt Road
- Coal Outcrop

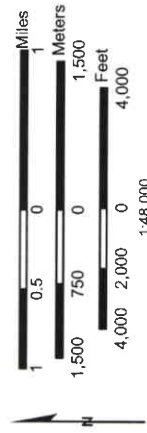
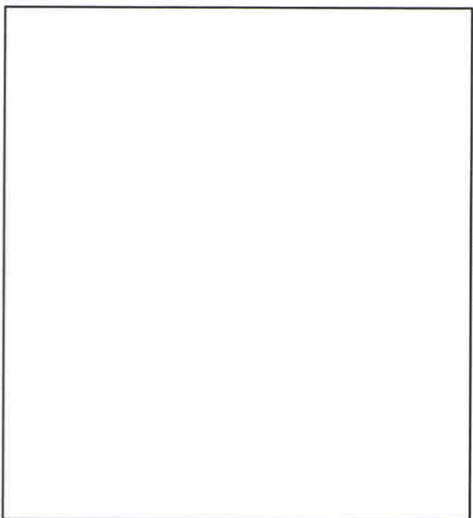
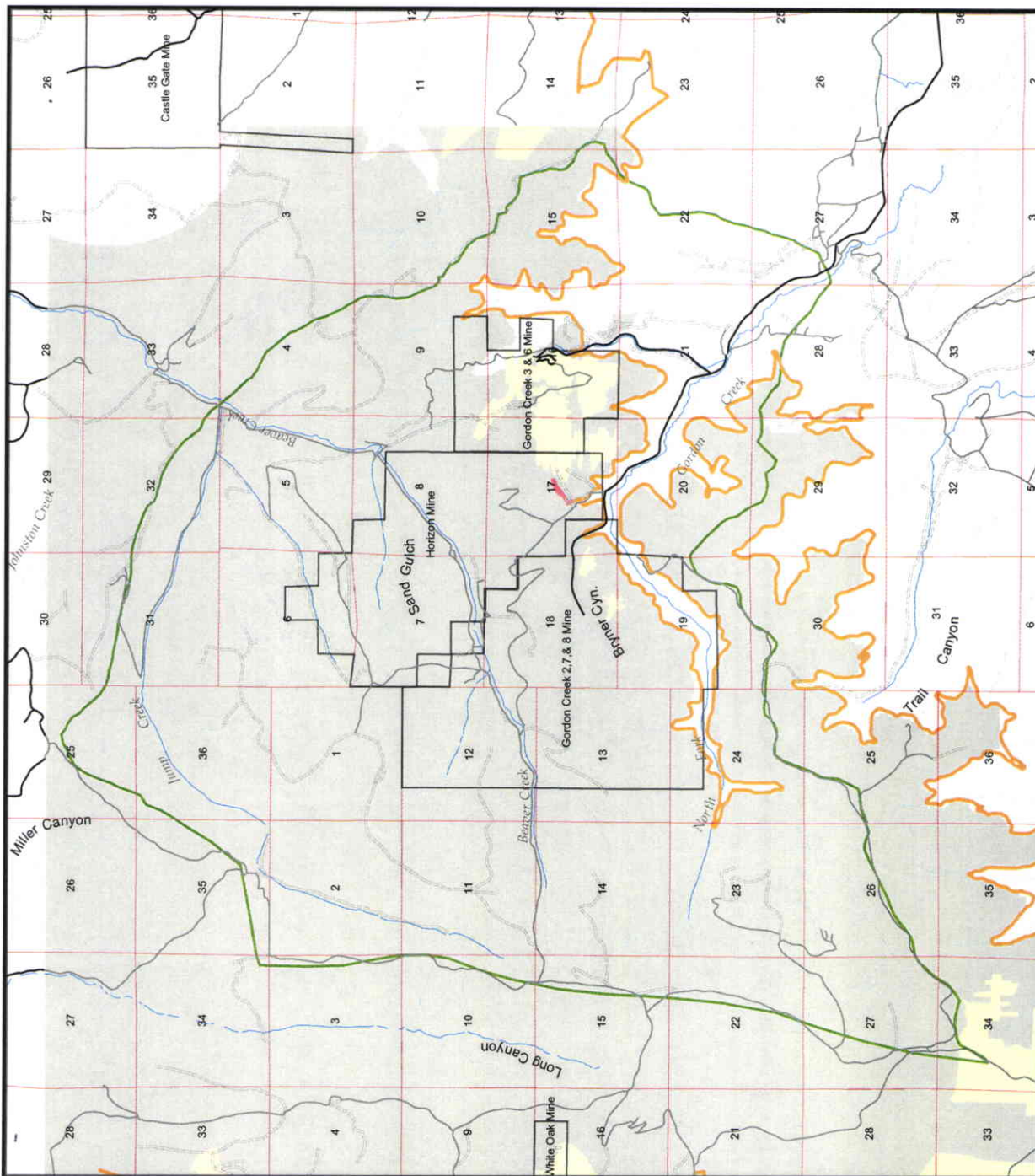


Figure 4
Cumulative Hydrologic Impact Assessment
Horizon Mine
MINE MAP - CASTLEGATE A SEAM
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 Compiled by AM Date: May 26, 2005



ACT0070020

- Wattis-Hiawatha Seam
- Mined Area
- CIA Area
- Perennial Streams
- Intermittent Streams
- Main Road
- Graded Road
- Dirt Road
- Coal Outcrop
- Disturbed Area

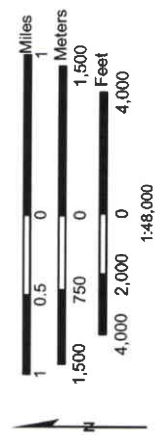
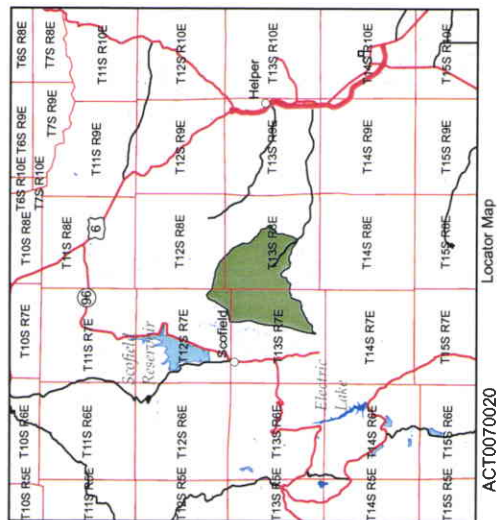
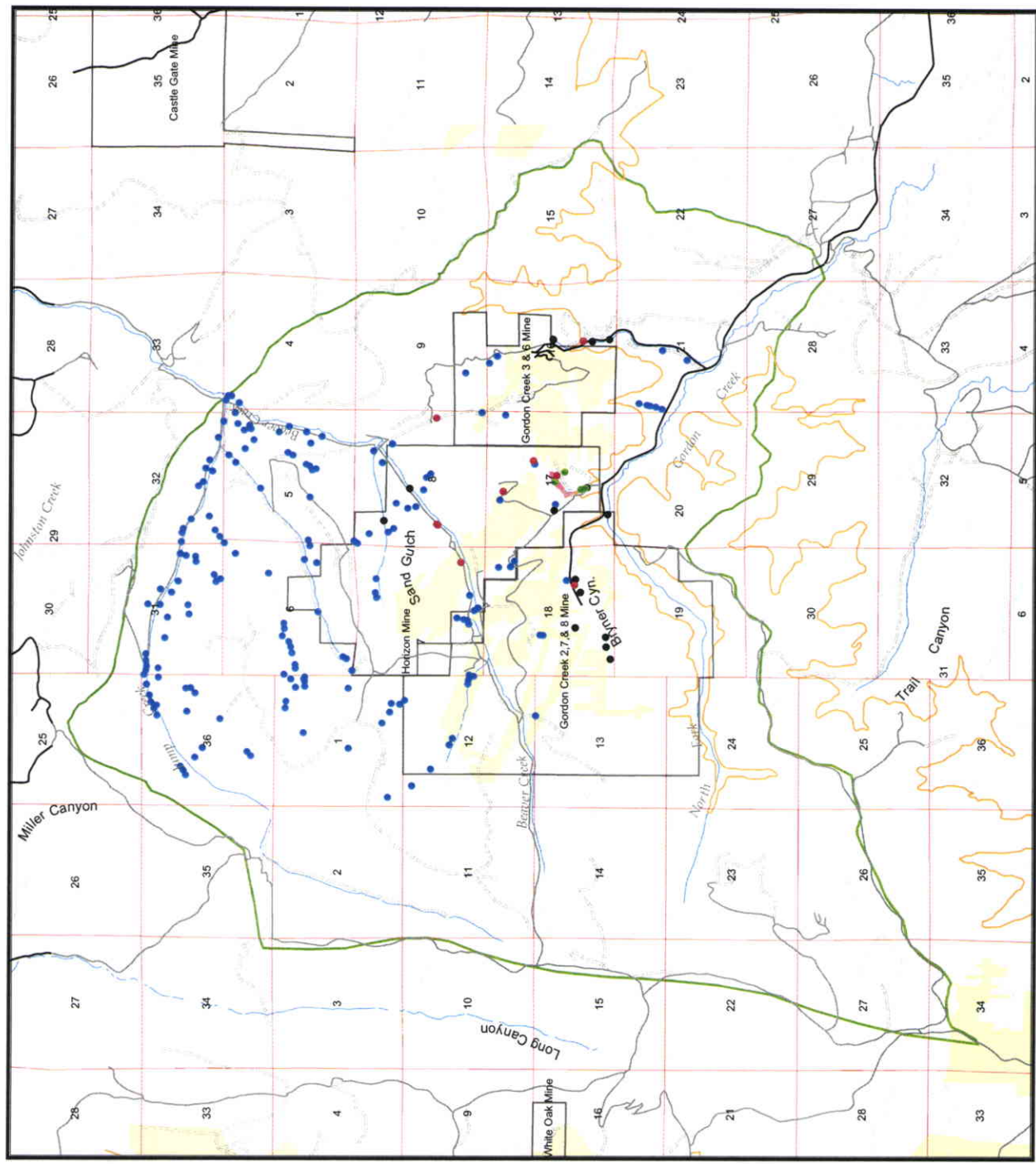


Figure 5
Cumulative Hydrologic Impact Assessment
Horizon Mine
MINE MAP - HIAWATHA SEAM (WATTIS)
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Compiled by AM Date: May 26, 2005



- Coal Outcrop**
- Water Monitoring Sites**
- Mined Area
 - Disturbed Area
 - CIA Area
 - Perennial Streams
 - Intermittent Streams
 - Main Road
 - Graded Road
 - Dirt Road
 - Well
 - Underground
 - UPDES
 - Surface
 - Spring

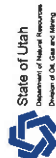
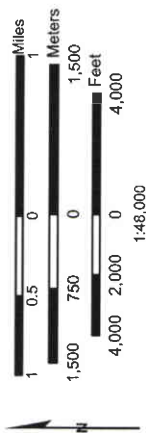


Figure 6
Cumulative Hydrologic Impact Assessment
Horizon Mine
HYDROLOGIC MAP
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Compiled by AM Date: May 26, 2005

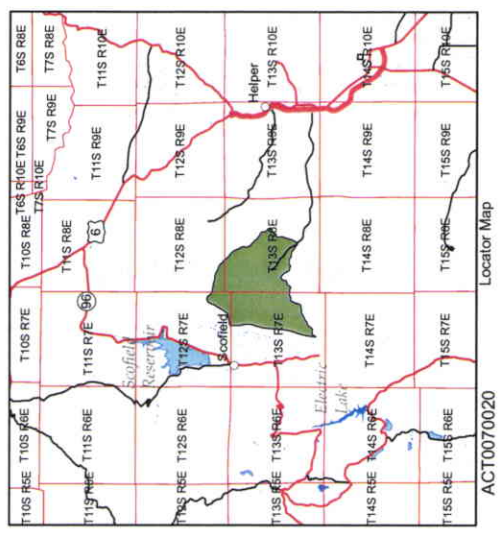
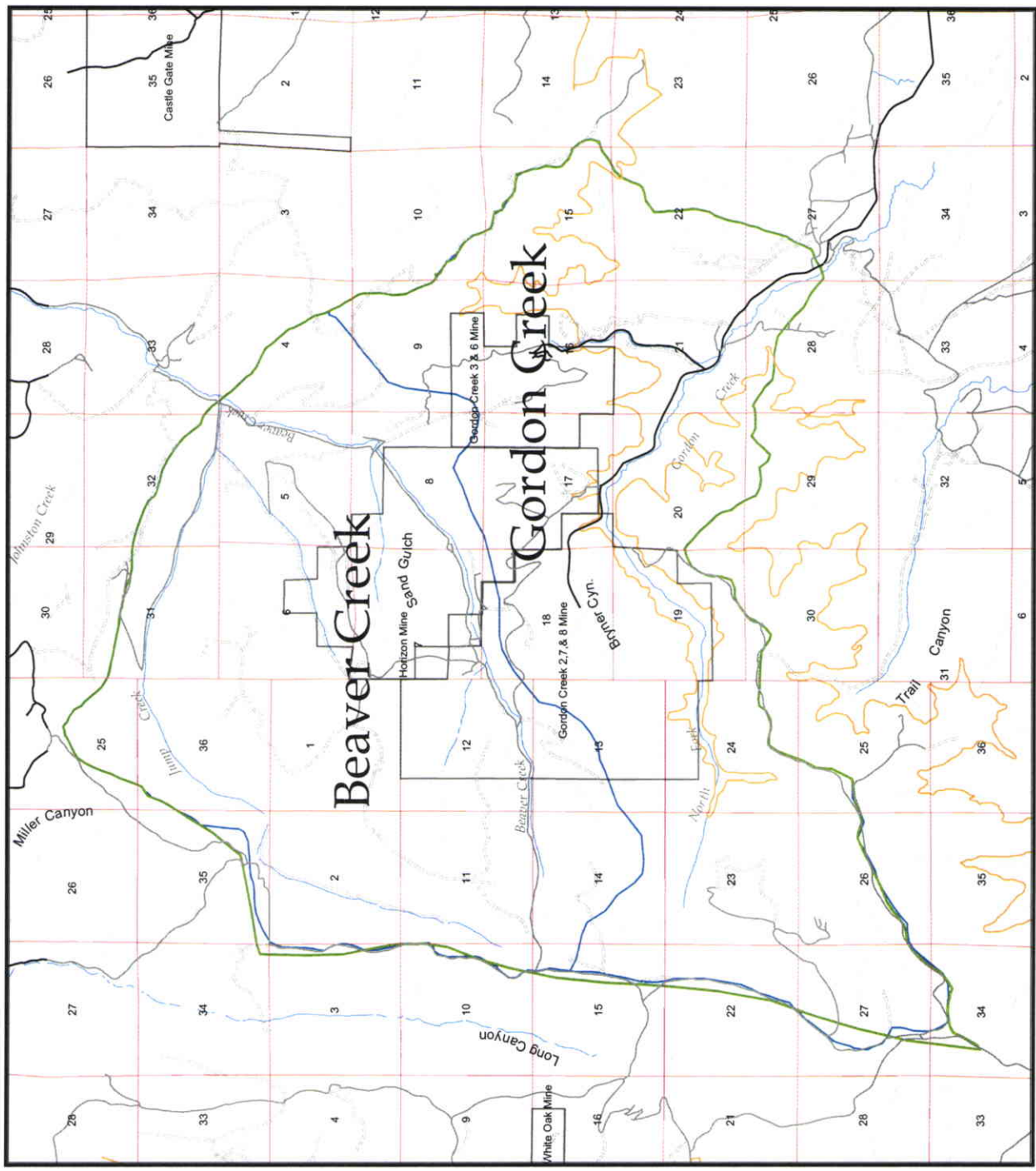


Figure 7
Cumulative Hydrologic Impact Assessment
Horizon Mine
WATERSHED BOUNDARY MAP
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 Compiled by AM Date: May 26, 2005

AFFIDAVIT OF PUBLICATION

STATE OF UTAH)

S3.

County of Carbon,)

I, Ken Larson, on oath, say that I am the Publisher of the Sun Advocate, a twice-weekly newspaper of general circulation, published at Price, State a true copy of which is hereto attached, was published in the full issue of such newspaper for 4 (Four) consecutive issues, and the first publication was on the 27th of July, 2004, and that the last publication of such notice was in the issue of such newspaper dated the 17th day of August, 2004.

Ken G. Larson

Ken G Larson - Publisher

Subscribed and sworn to before me this 17th day of August, 2004.

Linda Mayne

Notary Public My commission expires January 10, 2007 Residing at Price, Utah

Publication fee, \$ 465.92

**NOTICE OF COMPLETE APPLICATION
EXPANSION OF PERMIT BOUNDARY
HIDDEN SPLENDOR RESOURCES, INC.
HORIZON MINE
C/007/020**

Hidden Splendor Resources, Inc. (HSR), a Nevada Corporation, has submitted to the Utah Division of Oil, Gas and Mining, a complete application for adding the remaining Federal Coal Lease, U74804, (approximately 866 acres) to the existing mining and reclamation permitted area. The address of the applicant is: Hidden Splendor Resources, Inc., 57 West 200 South, Suite 400, Salt Lake City, Utah 84101

Hidden Splendor Resources, Inc., operates the Horizon Mine located approximately 12 miles west of U.S. Highway 6 on the Consumers Road within the south half of Section 17, Township 13 South, Range 8 East, SLBM. The currently approved Horizon Mine mining permit number is C/007/020. The permit area is located on the Standardville and Jump Creek, USGS 7.5 minute quadrangle maps. The description of the permit area is as follows:

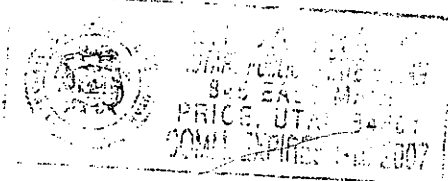
Township 13 South, Range 8 East, SLBM

Section 6:	NW1/4SE1/4, SE1/4SW1/4, SW1/4SE1/4, SE1/4SE1/4.
Section 7:	NW1/4, NE1/4, SE1/4, E1/2SW1/4, NW1/4SW1/4.
Section 8:	S1/2NW1/4, NW1/4NW1/4, SW1/4NE1/4, SW1/4, W1/2SE1/4
Section 17:	NW1/4, W1/2NE1/4, NE1/4SW1/4, N1/2SE1/4SW1/4, N1/2NW1/4SW1/4, NW1/4SE1/4, N1/2SW1/4SE1/4, NE1/4NE1/4.
Section 18:	

Containing 1,577 acres more or less consisting of 305 acres more or less of Fee coal (Hidden Splendor Resources, Inc.) and 1,272 acres more or less of Federal leased coal.

A copy of the permit will be available for inspection at the Utah Division of Oil, Gas and Mining, 1594 West North Temple, Suite 1210, Salt Lake City, Utah and the Carbon County Courthouse, 120 East Main Street, Price, Utah. Written comments or request for an informal conference regarding this application must be submitted within 30 days of the last publication date of this notice, to the Utah Division of Oil, Gas and Mining, Attention Coal Regulatory Program, 1594 West North Temple, Suite 1210, Salt Lake City, Utah, 84114-5801.

Published in the Sun Advocate July 27, August 3, 10 and 17, 2004.





State of Utah

**Department of
Natural Resources**

MICHAEL R. STYLER
Executive Director

**Division of
Oil, Gas & Mining**

JOHN R. BAZA
Division Director


JON M. HUNTSMAN, JR.
Governor

GARY R. HERBERT
Lieutenant Governor

May 24, 2005

OK

TO: Internal File

FROM: Pamela Grubaugh-Littig, Permit Supervisor 

RE: Compliance Review for Section 510 (c) Findings, Hidden Splendor Resources, Inc., Horizon Mine, C/007/0020

As of the writing of this memo, there are no NOV's or CO's which are not corrected or in the process of being corrected. There are no finalized Civil Penalties, which are outstanding and overdue in the name of Hidden Splendor Resources, Inc. Hidden Splendor Resources, Inc. does not have a demonstrated pattern of willful violations, nor have they been subject to any bond forfeitures for any operation in the state of Utah.

The Applicant Violator System (AVS) did not contain any information that would deny approval of this permitting action. (See attached, dated May 23, 2005).

an
Attachment:
O:\007020.HZN\COMPLIANCE\AVS5242005.DOC

Application Evaluation Report Applicant Violator System 23-May-2005 16:21:45

State : UT Permit No : ACT007020 Appl No : ACT007020
Permittee : 153690(HIDDEN SPLENDOR RESOURCES INC) Seqno : 3
Applicant : 153690(HIDDEN SPLENDOR RESOURCES INC)

OSMRE: Comments/Analysis: Date : 23-May-2005 Mode : VIEW

SRA: Comments/Analysis: Date : 23-May-2005 Mode : UPDATE

SAVE(F5) DELETE(F8)
PRV_SCR(F3) QUIT(F4) CHOICES(F10)

0017



United States Department of the Interior
FISH AND WILDLIFE SERVICE

UTAH FIELD OFFICE
2369 WEST ORTON CIRCLE, SUITE 50
WEST VALLEY CITY, UTAH 84119

INCOMING,
CCCCCCCC
CC: W. G. J. H. H.

In Reply Refer To

FWS/R6

ES/UT

04-1483

April 19, 2005

D. Wayne Hedberg
Permit Supervisor
Division of Oil, Gas, and Mining
1594 West North Temple, Suite 1210
P.O. Box 145801
Salt Lake City, Utah 84114-5801

RE: Informal section 7 Endangered Species Consultation, Permit Boundary Expansion,
Hidden Splendor Resources, Inc., Horizon Mine, C/007/0020

Dear Mr. Hedberg:

The U.S. Fish and Wildlife Service (Service) has reviewed your letter of September 21, 2004 and e-mails of April 15 & 18, 2005, from Joe Helfrich of your office. Potential impacts to proposed or listed species from mining activities have been previously addressed in the Service's September 24, 1996 Biological Opinion and Conference Report on Surface Coal Mining and Reclamation Operations under the Surface Coal Mining and Reclamation Act of 1977. As part of the terms and conditions of this BO, the regulatory authority must implement and require compliance with any species-specific protective measures developed by the Service field office and the regulatory authority.

We concur with your "no effect" determination for the following candidate, threatened and endangered species and critical habitat included in the species list for Carbon County: Graham beardtongue, Uintah Basin hookless cactus, bald eagle, Mexican spotted owl, Western yellow-billed cuckoo, Black-footed ferret, bonytail, humpback chub, Colorado pikeminnow, and razorback sucker. No endangered species-specific protective measures for these species are considered necessary for the subject project.

Should project plans change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered.

RECEIVED

APR 21 2005

OIL, GAS & MINING

Only a Federal agency can enter into formal Endangered Species Act section 7 consultation with the Service. A Federal agency may designate a non-Federal representative to conduct informal consultation or prepare a biological assessment by giving written notice to the Service of such a designation. The ultimate responsibility for compliance with ESA section 7, however, remains with the Federal agency.

We appreciate your interest in conserving endangered species. If further assistance is needed or you have any questions, please contact Diana Whittington, at (801) 975-3330 extension 128.

Sincerely,

A handwritten signature in dark ink, appearing to read "H. R. Maddux", written in a cursive style.

Henry R. Maddux
Utah Field Supervisor

cc: OSM - Denver (Attn: Ranvir Singh)

0028



State of Utah

JON M. HUNTSMAN, JR.
Governor

GARY R. HERBERT
Lieutenant Governor

Department of Community and Culture

YVETTE DONOSSO DIAZ
Executive Director

Division of State History / Utah State Historical Society

PHILIP F. NOTARIANNI
Division Director

June 10, 2005

James H. Dykmann
C/007/0020

Pamela Grubaugh-Littig
Division of Oil, Gas and Mining
1594 West North Temple, Suite 1210
P. O. Box 145801
Salt Lake City UT 84114-5801

RE: Federal Lease Addition #74804, Hidden Splendor Resources, Inc., Horizon Mine,
C/007/0020, task ID #2249

In Reply Please Refer to Case No. 00-1633

Dear Ms. Grubaugh-Littig:

The Utah State Historic Preservation Office received the referenced information. After consideration of the consultation request in behalf of DOGM, the Utah Preservation Office provides the following comments per 36 CFR 800.

Section 106 Consultation DOGM; USHPO concurs with the determination of No Historic Property Affected; §36 CFR 800.4(d)(1) for entire lease.

This information is provided on request to assist with state law responsibilities. As specified in 36 CFR 800, final determinations concerning cultural resources are the State Lead Agency's. If you have questions, please contact me at (801) 533-3555. My email address is: jdykman@utah.gov

As ever,

James H. Dykmann
James H. Dykmann
Deputy State Historic
Preservation Officer - Archaeology

JLD:00-1633 DOGM/NPA

0006



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Utah State Office

P.O. Box 45155

Salt Lake City, UT 84145-0155

<http://www.blm.gov>



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FEB 09 2005

IN REPLY PLEASE REFER TO:
3482, UTU-74804, (UT-923)

BLM OFFICE RECEIVING FEB 07 2005

Certified Mail--Return Receipt Requested
Certificate No.

Derrel Curtis
General Manager
Hidden Splendor Resources
P.O. Box 32
Helper, Utah 84526

Re: Modification to the Resource Recovery and Protection Plan (R2P2), Horizon Mine
Federal Coal Lease UTU-74804

McKinnis
0607/0020
FAX PFO
Copy Wayne H, N,
and PDM

Dear Mr. Curtis:

The Bureau of Land Management (BLM) has received a modification to the R2P2 from Hidden Splendor for the subject mine. The modification revises the timing and layout of the mining plan now that Hidden Splendor has restarted the Horizon Mine after acquisition from the previous lessee. The revision is for the only Federal coal lease, UTU-74804 and associated fee coal lands.

The Hidden Splendor mining plan is based on a north-west/south-east orientation. Hidden Splendor states that the orientation will allow for panels to parallel the prevalent faulting trend and to probe/cross the faults with submains.

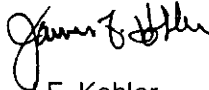
The BLM agrees with the proposal. The new layout will avoid multiple fault crossings in mining panels and, in turn, provide for better delineation of the faults. Remaining recoverable reserves are projected by Hidden Splendor to be 5.9 million tons and they report that 0.52 million tons have been recovered as of 10 Jan 2005. BLM has independently confirmed that 5.9 million remaining recoverable tons is reasonable.

BLM last inspected the mine on 22 September 2004. Some changes have been made to the overall plan approved by this letter and attached map. Hidden Splendor is requested to provide modifications to this approved mine plan on or before 28 February 2005.

This approval of a minor modification to an existing R2P2 is Categorically Excluded from the National Environmental Policy Act (NEPA) analysis in that no new surface disturbance will occur from this action as stated in Overview of BLM's NEPA Process, February 1997, Appendix 2, page 2-7 (F)(7).

The modification of the R2P2 complies with the Mineral Leasing Act of 1920, as amended, the regulations at 3480, and the lease terms and conditions and will achieve maximum economic recovery of the Federal coal. The revised R2P2 for the Horizon Mine is approved as submitted. A copy of the approved mine map is enclosed. If you have any questions, please contact Stephen Falk at the Price Field Office (435) 636-3605 or Jeff McKenzie of my staff at (801) 539-4038.

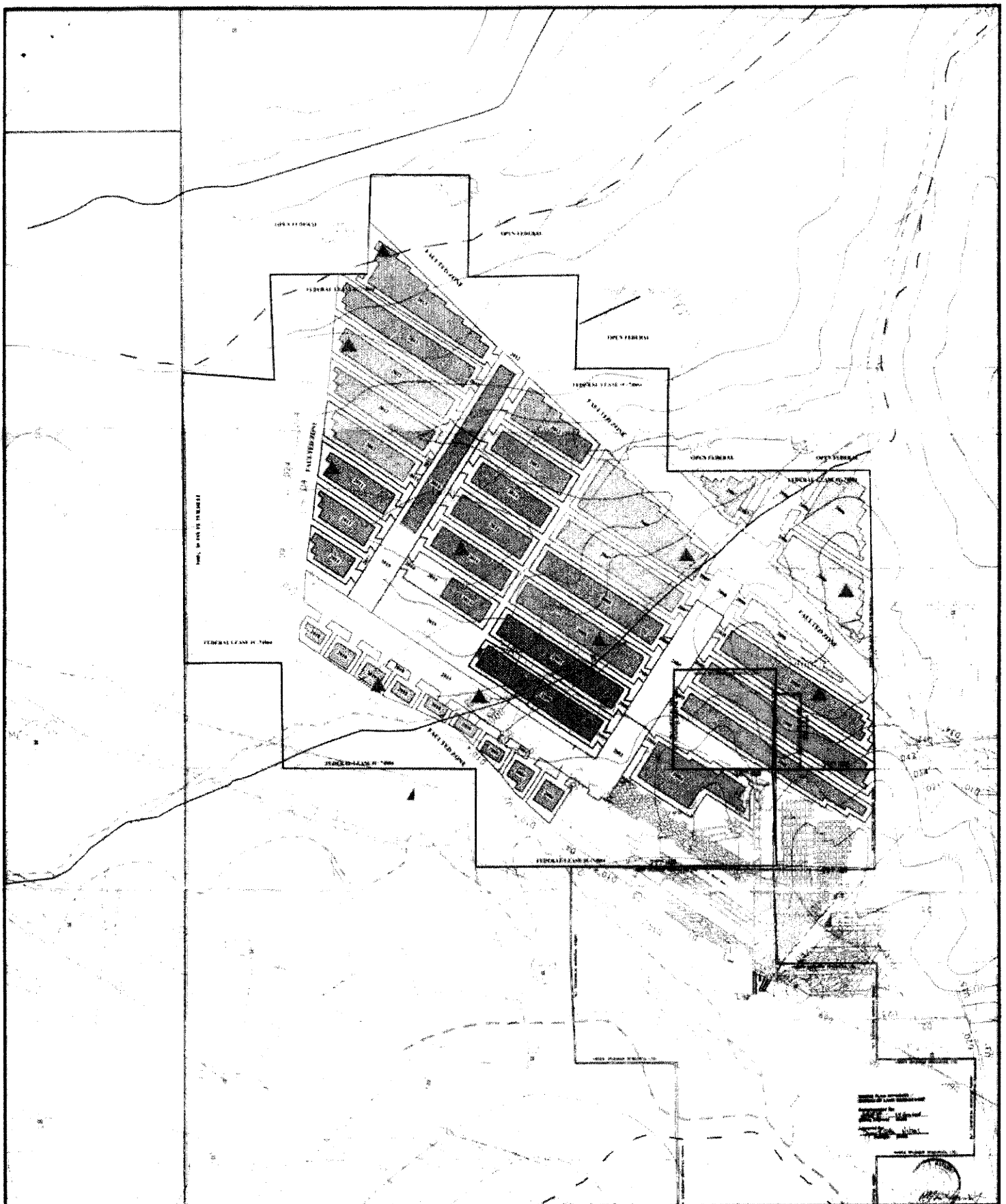
Sincerely,



J.F. Kohler
Branch Chief, Solid Minerals

Enclosures:
Approved Mine Map

cc: UT-070, Price Field Office (w/encl.)
Utah Division of Oil Gas and Mining (w/encl.)
1594 West North Temple, Suite 1210
Salt Lake City, Utah 84114-5801



LEGEND: 2003 ADVANCE [Symbol] 2004 RETREAT [Symbol] 2005 ADVANCE [Symbol] 2006 RETREAT [Symbol] 2007 ADVANCE [Symbol] 2008 RETREAT [Symbol] 2009 ADVANCE [Symbol] 2010 RETREAT [Symbol] 2011 ADVANCE [Symbol] 2012 RETREAT [Symbol] 2013 ADVANCE [Symbol] 2014 RETREAT [Symbol] 2015 ADVANCE [Symbol] 2016 RETREAT [Symbol] 2017 ADVANCE [Symbol] 2018 RETREAT [Symbol] 2019 ADVANCE [Symbol] 2020 RETREAT [Symbol] 2021 ADVANCE [Symbol] 2022 RETREAT [Symbol]				2023 ADVANCE [Symbol] 2024 RETREAT [Symbol] 2025 ADVANCE [Symbol] 2026 RETREAT [Symbol] 2027 ADVANCE [Symbol] 2028 RETREAT [Symbol] 2029 ADVANCE [Symbol] 2030 RETREAT [Symbol] 2031 ADVANCE [Symbol] 2032 RETREAT [Symbol] 2033 ADVANCE [Symbol] 2034 RETREAT [Symbol] 2035 ADVANCE [Symbol] 2036 RETREAT [Symbol] 2037 ADVANCE [Symbol] 2038 RETREAT [Symbol] 2039 ADVANCE [Symbol] 2040 RETREAT [Symbol] 2041 ADVANCE [Symbol] 2042 RETREAT [Symbol]	
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20° ANGLE OF DRAIN
30° ANGLE OF DRAIN

▲ PROPOSED MONITORING STATION

MONITORING STATIONS NEEDED TO MONITOR AND CONTROL OVERBURDEN AND SUBSIDENCE MONITORING POINTS

▲ BASE STATIONS ELEVATION AND HORIZONTAL CONTROL (PERMANENT)

Hidden Splendor Resources
Mountain View
2500 Hwy 10, Mountain View, AZ 85705
520-425-1313 Fax # 480-425-1314

DATE	2003-10-01	SCALE	1" = 400'
MINES PLAN (BY YEAR) WITH SEAM HEIGHT AND OVERBURDEN & SUBSIDENCE MONITORING POINTS			
PLATE 1-1 <small>FEDERAL COAL LEASE NO. 174004</small> <small>1740 D.D.S.M. PERMIT NO. 5, 2007/2008</small>			



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Utah State Office
P.O. Box 45155
Salt Lake City, UT 84145-0155
<http://www.blm.gov>



IN REPLY PLEASE REFER TO:
3482, UTU-74804, (UT-923)

Pamela Grubaugh-Littig
Permit Supervisor
Division of Oil Gas and Mining
1594 West North Temple Street, Suite 1210
Salt Lake City, Utah 84114-5801

Re: Surface Managing Agency Response, Federal Coal Lease Addition, UTU-74804,
Horizon Mine, Hidden Splendor Resources, Inc., C/007/020

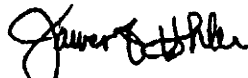
Dear Ms. Grubaugh-Littig:

The Bureau of Land Management (BLM) has reviewed the subject permit application package for adding the remaining portion of Federal coal lease UTU-74804 to the approved Horizon Mine Permit. This letter documents the Bureau's findings for post-mining land uses as required by the laws governing the Federal coal lease and the public lands.

There is one 40 acre tract of public land inside the permit area that is managed by the BLM. The rest of the surface lands are under private ownership. The public lands inside the permit area are designated open for coal leasing under the current land use plan. There is no planned surface disturbing activities on the public lands and non-mineral resources will not be affected. Hence, the BLM concurs with the submitted Horizon Mine Plan with regards to post-mining land use on public lands and the protection of non-mineral resources. Also, our previous recommendation for the approval of the resource recovery and protection plan (R2P2) for the area to be added to the permit, is still valid.

If you have any questions, please contact Jeff McKenzie of my staff at 801-539-4038 or Stephen Falk at the Price Field Office 435-636-3605.

Sincerely


Chief, Solid Minerals

cc: Office of Surface Mining
1999 Broadway, Suite 3320
Denver, Colorado 80202-5733
Price Field Office, UT-070
Hidden Splendor Resources, Inc.
P. O. Box 32
Helper, Utah 84526

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